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USSR Report

TRANSPORTATION

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ACHIEVEMENTS OF KAMOV HELICOPTER DESIGN BUREAU

Moscow GRAZHDANSKAYA AVIATSIYA in Russian No 2, Feb 84 pp 34-35

[Article by S.V. Mikheyev, chief helicopter designer, Lenin Prize laureate: "For the Needs of the Economy"]

[Text] What are helicopter designers working on these days? What rotor-wing machines are being created, in particular, at the Design Bureau imeni N.I. Kamov? L. Sviridov, Ye. Vinogradov and many other readers have asked the editors these questions. They will find the answers to these questions in the article below.

Our collective has accumulated some experience in developing rotor-wing aircraft for the maritime fleet and the national economy. Its history begins in 1948, when a test-design bureau was created under the leadership of Chief Designer N.I. Kamov. The first product of the new helicopter test design bureau, the K-10 single-seat communications and observation helicopter, was the development of an experimental design. The new machine was tested on various types of ships and laid the groundwork for the wide use of helicopters by the maritime fleet.

Further experience in using helicopters showed the necessity of increasing their lifting capacity. Subsequent helicopter designs were able to do not only aerial reconnaissance, but also take part in loading and unloading operations. In other works, they were multipurpose and universal in application.

The new Ka-15 was a step forward compared to the Ka-19. It solved many problems, particularly the elimination of vibration, blade convergence and flutter. Series production of the helicopter began in 1956. Alongside the ship model, a multipurpose model, Ka-15M, was developed for the aerial application of chemicals. Later, it became the base for a new design: the Ka-18 "flying automobile." For its originality, this design was awarded a First Degree Diploma and a Gold Medal at the International Exhibition in Brussels.

Combining the experience derived from using the Ka-15 and Ka-18 helicopters, the collective developed the Ka-26 multipurpose helicopter. Its development involved a difficult task: achieve low helicopter operating costs while doing a variety of jobs in the national economy. This required that the helicopter be inexpensive, have a high load-to-weight ratio and allow non-productive service time to be cut to a minimum.

The collective solved the problem. The Ka-26 helicopter is widely used by Aeroflot and by the aviation companies in fraternal socialist countries. About 15 different equipment configurations are used on it. But the machine's capabilities are best brought out in the aerial application of chemicals. In the opinion of Hungarian specialists, the Ka-26 makes it possible to protect one-fifth of the grape harvest from pests. In addition, it allows the efficient and economical use of chemicals. All of this is made possible by the aerodynamic characteristics of the coaxial rotor.

Thus, in the third decade of its existence, the collective laid the groundwork for developing a new generation of coaxial helicopters notable for their high load-to-weight ratio and good technical performonce characteristics. The Ka-26 design incorporation progressive materials, including composites and titanium. New weight classes for coaxial helicopters were instituted.

One can note a number of the collective's successes which formed a good base for subsequent work. One of these is the perfection of the coaxial helicopter design. This is even more significant in light of the fact that, while working on the coaxial design, we could not take advantage of any existing foreign or domestic technology.

None of the helicopters developed was a copy of a previous design. Furthermore, each one had no counterpart in the domestic or foreign helicopter industry. For example, a fundamentally new fiberglass blade design was developed, along with a manufacturing process for it. This made possible a reduction in labor input and production costs, while significantly improving reliability and the supply of blades.

We were one of the first to use automatic devices in helicopter control systems in order to improve performance. Thus, for the first time, certain flight regimes, such as hovering, were automated; pre-programmed flight plans were used. Thanks to this, an entire flight, including complex operations, can be carried out according to pre-programmed instructions. Much of the flight can even be completely automated. This is a step towards making helicopters capable of carrying out their assigned tasks under any conditions.

An achievement of the collective that must be noted is the mastery of difficult ship operations. This involved solving the problems of mutual accommodation in helicopter and ship designs. Also, problems in corrosion protection of structures and devices needed to be solved. Other problems included helicopter take-off from a small area with nearby superstructures while the ship is moving and severly rocking. Also, special ship-based technology for helicopter servicing was needed. Therefore, it was fitting that our test-design bureau was assigned the task of building the helicopter which would become a component part of various types of modern ships and give them completely new qualities.

That helicopter, the Ka-25K, with a gas turbine engine, was built. Its introduction was a further step in the development of ship-board helicopter aviation.

This helicopter made its first test flight from the nuclear-powered ship Sibir' under polar night conditions. As the newspapers noted at the time, there were very difficult flight conditions. The icebreaker's path was reconnoitered for up to 200 km. At first, they "felt" the ocean's surface by radar. Then, assured that there were no tall obstacles, they descended for visual inspection of the ice field, using powerful spotlights.

The tests proved beyond a doubt the helicopter's capabilities for ice reconnaissance. They also provided valuable material for making improvements in the helicopter intended for difficult service in the Arctic seas. This work culminated in the development of the Ka-32 helicopter.

It is different from its predecessors, first of all, in that it has a larger lifting capacity: it can lift and transport external loads up to 5 tons. At the same time, it takes up less space on the icebreaker's landing pad than an Mi-2 does! This points up the advantages of the coaxial design.

It was necessary to create a helicopter with a high load-to-weight ratio, low fuel consumption and a highly efficient main rotor.

The Ka-32 rotor design is the same as the Ka-26, except that it is made out of stronger fiberglass. The rotor blades are equipped with electric heating elements which can operate during the entire flight. This prevents various unexpected problems due to possible ice-sensor failure. The power of the on-board electrical system was increased to accommodate the system. Also, the engine air intakes arn heated with air from the compressor.

A distinguishing feature of the main rotor system is its folding blades. This is very important for a ship-based helicopter, since it saves space. However, it seems that users on dry land also like this feature: it makes it easier to tow the machine and to organize the area where it is parked.

A specific feature of Arctic exploration is prolonged low-speed flying. It is known that under these conditions vibration increases, leading to increased structural stress which reduces the service life. While the Ka-26, used for agricultural purposes, had low vibration without any special equipment provided, the Ka-32 required a pendulum damper system for vibration suppression. Weights are placed at the blade bases and adjusted in such a way that their vibrations are exactly out of phase with the blade vibrations.

To improve load-handling efficiency, the Ka-32 has an automatic lock which releases the external load as soon as it is place on the ground or on deck. Loads can also be carried in the cabin. A 300-kg-capacity on-board winch is equipped with the latest search, communications and illumination technology.

The new machine was first used in February and March of 1980 for taking convoys over the Murmansk-Dikson-Yenisey Gulf route. Ice reconnaissance was done day and night, in blizzards and fog, when no surface reference points were visible.

Besides reconnaissance, the helicopters were successful in transporting freight and passengers. When the amount of freight to be handled was not too large, the work was done without stopping the convoy.

In short, the N.I. Kamov Design Bureau, true to the traditions of its founder, continues its tireless creative work on developing rotor-wing machines capable of best fulfilling the needs of the economy in its part of the aviation sector.

12595
CSO: 1829/217

DESIGN BUREAU DIRECTOR ON CAREER OF SERGEY ILYUSHIN

Moscow MOSCOW NEWS in English No 14, 15-22 Apr 84 p 10

[Text]

Ninety years ago, a seventh baby, a boy, was born to the family of Vladimir Ilyushin, a peasant from the remote village of Dilyalevo in the Vologda Gubernia, half-way between Moscow and Arkhangelsk. He was named Sergey.

Sergey Ilyushin's life lasted an incomplete 83 years. He was a low-skilled labourer, a shoveller, a milk deliveryman, a lubrication worker at a railway, a timekeeper at a factory, a stoker, and an assistant on one of Russia's first excavators and then became a leading aircraft designer of this century. He was awarded the title of Hero of Socialist Labour three times, and his work won him the Lenin Prize and several USSR State Prizes. Since first being elected to the USSR Supreme Soviet, he was continuously elected a member of the Soviet Parliament.

This brilliant record would be incomplete without explaining that the most important thing about him was his mission in life. He lived to create planes. They were designed at the bureau he set up, which was named in his honour. More than 50 types of aircraft have been built at this bureau.

ILYUSHIN'S SCHOOL

Last autumn the Sergey Ilyushin experimental design bureau celebrated its 50th anniversary. Today, the man in charge is General Designer Genrikh Novozhilov, a Corresponding Member of the USSR Academy of Sciences, twice Hero of Socialist Labour and winner of the Lenin Prize. Novozhilov is 59. His subordinates in the design bureau say that he went through the entire Ilyushin's school step by step.

I talked with Genrikh Novozhilov in the museum-study of Academician Ilyushin where I saw models of all the planes whose blueprints the bureau had made.

"In 1970, Ilyushin felt that his failing health didn't permit him to work as much as he wanted to," Novozhilov said. "Although he retired, he was interested in how things were going in the bureau to the last day of his life, and he was always ready to give sound advice and to support a daring innovation."

Q.: Yet, the bureau's latest planes – the IL-76 cargo plane and the IL-86 passenger jumbo jet – were designed without Ilyushin's participation. True?

A.: Yes, but we have carefully preserved the traditions which emerged under him and are further developing the plane-designing school he founded. Solving a particularly difficult problem, I often catch myself wondering what Ilyushin would have done in a situation like mine.

Q.: What are the main principles of Ilyushin's school?

A.: Ilyushin once said it is much more difficult to put together a workable team of enthusiasts and people who think like you than to design even the best of planes. His method of designing planes ruled out any desire to achieve top performance characteristics, such as maximum flying speed, the longest possible range, or high carrying capacity, at the expense of the other characteristics. Sergey Vladimirovich often said, "The country does not have unlimited resources. Let us therefore make planes which aren't ruinous to the state."

One quality which Ilyushin possessed deserves special mention. He anticipated the course of develop-

ments in aviation for many years ahead. On his own initiative, he often began designing a plane which was ready to be mass produced when the need for just such a plane became particularly great. One of these models was the IL-2 attack plane.

FROM GLIDER TO AIRBUS

The first plane Ilyushin designed was in 1935 – the TsKB-26, a high-speed long-range plane. Its pilots set several world aviation records.

TsKB is the Russian abbreviation for the Central Design Bureau, set up at the Menzhinsky Works in 1933.

Let's look at the events in this future Academician's life before this turning point in his career. For a number of years he had been a member of the Scientific and Technical Committee of the Soviet Air Force. He was one of the people in charge of the national glider trials which used to be held in the Crimea regularly (since 1923). It was at these trials that Ilyushin first met Sergey Korolyov, Oleg Antonov, and Alexander Yakovlev, who were later to become outstanding aviation and space technology designers, and who, like Ilyushin himself, began by designing gliders.

"I've always regarded designing planes on my own to be the main mission in my life," Sergey Ilyushin said upon recalling the numerous requests in the early 1930s that he be made a "pure" designer.

Ilyushin thought much about air-battle tactics. Like many other Soviet specialists, he rejected the doctrine propounded by the Italian General Douhet that the air force alone could win a war without the other branches of the armed forces. He was firmly convinced that what was needed was a plane for immediate operations in battlefield fighting in close contact with ground troops. Aviation historians know that attempts to build a "flying tank" made before Ilyushin had ended in failure.

Many years later, Ilyushin would recall: "Into the armoured body, which we had given a good aerodynamic shape, we fitted all the vital elements of a plane – the engine, the cockpit for the pilot and gunner, and the oil, fuel and cooling systems."

The plane builders didn't put armour on top of the plane like coats of armour which were put on knights in the Middle Ages but rather made it an integral part of the plane. Among the planes fighting in World War II, the IL-2 had no rivals. The nazis called it "the black death".

"While our planes were still fighting in battles, the design bureau was already thinking about making planes for passenger transportation." These words by Sergey Ilyushin were recalled by General Designer Novozhilov when his design bureau was celebrating its 50th anniversary and he told representatives of CEMA countries' airlines about the future plans of the Soviet designers.

Odd though it may seem, the war was still raging when the aircraft designers turned their thoughts to qualitatively new problems arising in civil aviation. Ilyushin was one of the first to install Soviet-made jet engines on his aircraft, the first being the experimental four-engined IL-22, whose basic composition has served as a prototype for the IL-86 airbus and for all similar foreign models.

Shortly before Sergey Ilyushin died, PRAVDA published his last interview. The designer was asked, "Which of the planes you've designed is the most precious and dear to you?"

"Among those I like best I can mention the two planes with which we began – the IL-2 and the IL-4, and as for the latest – the IL-18 and the IL-62."

It's hard to say how many million passengers have been carried by Ilyushin planes since the appearance of the piston twin-engined IL-12 in 1946. This was succeeded by the IL-14, which was manufactured in 15 different modifications. Then came the four-engined IL-18 turbo-prop. Planes of this type were purchased by 17 countries.

Very soon, the intercontinental IL-62 was designed and later modified several times.

"Since we first began work on the IL-86 airbus," said Novozhilov, "we proceeded from the fact that it was to serve as the basic plane for a number of subsequent models. This is a tradition at the design bureau, which was first introduced by its founder, Sergey Ilyushin. Today, we are using the IL-86 as the prototype for a plane with a much longer range. We describe it as a long-range main plane. We're also working on a sort of double of the twin-engined IL-14 model, with the difference being that it is fitted with a new design of turbo-prop engines with multiblade propellers."

CSO: 1812/188

RECENT USSR ACCESSION TO 1956 FREIGHT HAULING CONVENTION

Moscow FOREIGN TRADE in English No 4, Apr 84 pp 37-40

[Article by Professor Oleg Sadikov, doctor of juridical sciences: "USSR Accession to the 1956 Convention on the Contract for the International Carriage of Goods by Road"]

[Text]

On August 1, 1983, the Presidium of the USSR Supreme Soviet adopted an Ukaz (Decree) on the accession of the USSR to the 1956 Convention on the Contract for the International Carriage of Goods by Road,[1] which defines the commercial conditions of such carriage. This is an important event in the area of legal regulation of Soviet foreign trade. Road transport has long occupied an important place in the shipment of foreign trade cargoes, and the Soviet Union's accession to the 1956 Convention will help towards the rationalization of such shipments and make the legal mechanism applied in the sphere of interstate transport more effective.

Among the present international agreements on road transport the 1956 Convention in its content and circle of participants is one of the most important international documents. Worked out within the UN ECE Inland Transport Committee, the Convention was signed in Geneva on May 19, 1956, and came into effect on July 2, 1961. Since then its membership has grown considerably and now practically all European countries, socialist states included (in all 23) have ratified the Convention.

It should be noted that although the USSR was not a party to the Convention in the past, its main provisions were adhered to by Soviet road transport and foreign trade organizations. The Main Conditions for the international carriage of goods by Soviet road transport, which were approved on September 5, 1969, by the RSFSR Ministry of Road Transport by agreement with the USSR Ministry of Finance and the USSR Ministry of Foreign Trade, took into account the existing international practice in this field and reproduced many

of the Convention's provisions. The commercial transactions signed by Sovtransavto, the Main Department of the RSFSR Ministry of Road Transport, equally took into account the conditions of goods carriage contained in the Convention.

That is why the accession of the USSR to the 1956 Convention on the Contract for the International Carriage of Goods entails no radical changes in the conditions for the carriage of Soviet foreign trade goods by road. Today, however, when the USSR is a party to the Convention, its provisions become obligatory on Soviet road transport enterprises, foreign trade organizations and their customers, and it is necessary to carefully study its contents with a view to their correct and efficient application. Some provisions of the Convention are very complex, and a series of practical aids and commentaries have been published abroad to explain the contents of the Convention.[2]

The Convention has 51 articles arranged in eight chapters: Scope of Application; Persons for Whom the Carrier is Responsible; Conclusion and Performance of the Contract of Carriage; Liability of the Carrier; Claims and Actions; Provisions Relating to Carriage Performed by Successive Carriers; Nullity of Stipulations Contrary to the Convention; Final Provisions.

By virtue of Art. 1 Para 1. of the Convention the latter is applicable to any contract for the carriage of goods by road, when the place of taking over of the goods and the place designed for delivery are in two different countries, of which one at least is a contracting country.[3] Thus, the provisions of the Convention should also be effective in relation to carriage by road to and from countries which are not signatories to the Convention. In such countries, however, practical application of the provisions of the Convention may prove impossible, for the jurisdiction bodies will be guided by national law, and to eliminate such a situation the Convention contains special rules.

Under Art. 6 Para. 1 (k) the consignment note shall contain a reservation to the effect that the carriage is subject to the provisions of the Convention, while in virtue of Art. 7 Para. 3., in the absence of such a statement the carrier shall be liable for all expenses, loss and damage sustained through such omission by the person entitled to dispose of the goods. These rules should make the provisions of the Convention applicable in countries, which are not parties to it, as the contract law agreed upon by the parties when signing the contract of

carriage. Otherwise the legal regime of international carriage by road will not be standard, and the solving of many practical questions would be extremely difficult.

As can be seen from the contents of the Convention, the subject of the latter are the contract terms for the international carriage of goods by road. Thus the provisions of the Convention do not affect the mechanism existing in the USSR for arranging and planning such carriage, including the material liability of Soviet organizations for failure to fulfil the planned carriage assignments; as in the past, its regulation continues to be covered by internal Soviet legislation. The provisions of the Convention are not applicable to the terms of foreign trade purchase and sale transactions (shipments), with which the delivery of the goods may be effected by road, for contracts of purchase and sale (shipments) and those of carriage are autonomous contracts which are subject to different legal regimes.

Nevertheless, the provisions of the Convention should be considered when signing and executing foreign trade purchase and sale transactions (shipments), if they provide for or permit the carriage of the sold goods by road. In foreign trade contracts with firms in countries which are not parties to the Convention it is better to advise the delivery of the goods by road on the terms of the Convention, and in the case of the carriage of especially valuable goods, to provide for their insurance, for the Convention limits the liability of the carrier by road, a question being discussed later in this article.

As for the terms of the contract for the international carriage of goods by road, which constitute the subject of the Convention, the latter on this matter contains a series of prescriptions which are new and unusual in Soviet transport law; what is more, all its provisions are strictly binding on the contracting parties and any departure from them by agreement between the participants in the contract of carriage shall be null and void (Art. 41). Only a few of the provisions in the Convention contain alternative prescriptions giving the parties the right of choice.

The rules of the Convention above all reflect the legal-transport specifics of the international carriage of goods by road, when the cargo is delivered directly from the consigner to the consignee by one carrier, without transhipment, and in relatively small batches. At the same time, on many questions the Convention reproduces the now recognized provisions of international agreements on the carriage of goods by other means of transport—sea and rail. For this reason the experience gained in employing such carriage may be used in the study and practical implementation of rules in the Convention which is new to us.

In accordance with the Convention, a contract for international carriage by road is confirmed by a consignment note which is made out in three original copies (the first for the consigner, the second for the consignee and the third for the carrier) and signed by the consigner and by the carrier. The absence, irregularity or loss of the consignment note shall not affect the existence or the validity of the contract of carriage which shall remain subject to the provisions in the Convention. Legal practice law abroad proceeds from the premise that in case of the absence or inadequacy of the consignment note, the provisions of the contract of carriage may be confirmed by other evidence according to the general rules of civil proceedings.

The Convention does not stipulate the form of the consignment note (only its particulars); it is drawn up by the International Road Transport Union (IRTU) of which the Association of Soviet International Road Carriers is a member. The international consignment note used by Soviet road transport organizations almost coincides in form with the IRTU consignment note. When completing consignment documents account should be taken of the fact that the USSR is a party to several customs conventions which appreciably ease customs procedures when conveying goods by road.[4]

On accepting the goods, the carrier shall, according to the Convention, check the accuracy of the statements in the consignment note as to the number of packages, their marks and numbers, and the apparent conditions of the goods and their packing. The consigner may require the carrier to check for extra remuneration the gross weight of the goods or their quantity as well as the contents of the packages, and enter the result of the checks in the consignment note. The carrier, however, is entitled, as in carriage by sea, to enter his reservations in the consignment note on the impossibility of checking the quantity of the packages, their marks and numbers, as well as the apparent condition of the goods and their packing (Art. 8 Para 2). As the practice of carriage by sea shows, the presence of such reservations in the consignment note puts the goods owner in an unfavourable position and substantially reduces the responsibility of road transport organizations for the state and safety of the goods consignment.

The time-limit for delivery shall be agreed upon by the parties, and if this has not been done, such time-limit shall be the time it would be reasonable to allow a diligent carrier, with due regard for all circumstances including the time required for making up a complete load out of partial loads (Art. 19). The Convention lays down the rights of the consigner and the consignee as concerns the disposal of the goods carried and the manner of action in the event when there are obstacles to

the carriage and handling of the goods. No procedure is envisaged for the settlement of carriage payments, and these questions should be taken care of with due account of the delivery basis specified in the signed contracts. As far as Soviet organizations are concerned these questions can be dealt with in the established manner for settlements in international road carriage.

The Convention has a special article (Art. 22) containing regulations for the carriage of dangerous goods. Consigners of such goods should inform the carrier of the precise nature of the danger, enter this information in the consignment note or inform him on this point by other means. In the absence of such information the carrier may discontinue the transport of such goods or destroy them, and the consigner be made liable for all possible loss or damage.

Many European countries (19 nations) use the Agreement on the International Carriage of Dangerous Goods by Road of September 30, 1957, which indicates the list of dangerous goods permitted for carriage and requirements placed on vehicles used for their carriage. This agreement only refers to shipments between contracting parties (Art. I, Para.c). The USSR is not a party to this agreement.

No special regulations on the carriage of perishables are laid down in the Convention; it only provides for the carrier's right to realize such goods in the event when obstacles hold back their delivery (Art. 16, Para. 3). A series of important provisions on this point, however, is laid down in the Agreement on the International Carriage of Perishable Foodstuffs and on the Special Equipment to be used for such carriage of September 1, 1970, to which the USSR is also a party along with other European states (19 nations). The Agreement provides for certain demands to be made on the transporting facilities for the carriage of perishable goods, the procedure for their checking and the issuance of appropriate documents, as well as information concerning the temperature regime to be observed in such carriage.[5]

On receiving the goods delivered to him by road, the consignee should pay the charges shown to be due on the consignment note, but in the event of dispute on this matter the carrier is not required to deliver the goods unless security has been furnished to him (Art. 13). The Convention does not envisage any procedures for checking the delivered goods; it only contains reference to the possibility of their checking jointly by the carrier and the consignee (Art. 30, Para. 2). Consequently, these questions should be settled in accordance with national law.

The Convention defines in a more detailed manner the conditions and limits of the carrier's liability. By virtue of Art. 17, Para. 2 he is relieved of liability if the loss, damage or delay in delivery was due to circumstances outside the carrier's competence and the consequences of which he was unable to prevent. Here use is made of a formula accepted in international transport law and under which liability is imposed in accordance with the origin of the fault. In principle the burden of proving responsibility rests with the carrier; however, under special circumstances (defective packing, loading and unloading of the goods by persons acting on behalf of the owner of the goods, natural properties of the goods, the carriage of animals, and some other circumstances) the carrier's liability has to be proved by the owner of the goods.

As in the case of other international transport means, the liability of road transport organizations is limited to the maximum fixed by the Convention and not exceeding 25 francs per kilogramme of gross weight short. "Franc" means the gold franc weighing 10. 31 of a gramme and being of millesimal fineness 900.[6] In addition, the carriage and other charges incurred in respect of the carriage of the goods shall be refunded by the carrier in full in case of total loss or in proportion to the loss sustained in case of partial loss (Art. 23). The above-said limit shall not apply when the value of the goods is declared and or when the losses were caused by the wrongful act or neglect of the carrier. This latter rule is not of great practical importance, for the wrongful act of the carrier has to be proved by the owner of the goods, which in most cases he is not able to do as no evidence on this point is generally available.

The liability of road transport organizations in case of delay in delivery is also limited: if the claimant proves that damage has resulted from delay, the carrier shall pay compensation for such damage not exceeding the carriage charges (Art. 23, Para. 5). This gave rise to disputes between foreign parties, and the available court decisions proceed from the premise that in the particular case the carrier is liable to repay all carriage charges and not only for the section of the route where the delay took place.

Of special practical significance are the provisions in the Convention on claims against the carrier, for on their observance depends the possibility of obtaining compensation for damage or losses incurred, along with the quick settlement of disputes when they arise. The rules of the Convention on this question are rather peculiar and differ from the standards

laid down in other transportation agreements. As far as the delivery of goods is concerned, the Convention provides for two legal procedures which are implemented in a different order and entail different legal sequels: a statement of objection to the carrier and a written claim against him.

Reservations should be sent before expiry of the delivery time in the case of apparent loss or damage, and within seven days after delivery in the case of loss or damage not at once apparent. In the absence of any objection it is believed that the goods have been received by the consignee in the same state as described on the consignment note. Also within the same 7-day period reservations may be sent in the case of non-apparent loss or damage, also in cases when the goods were checked jointly by the carrier and the consignee. There is another rule in the Convention according to which no compensation shall be payable for delay in delivery unless a reservation has been sent in writing to the carrier within 21 days from the time that the goods were placed at the disposal of the consignee (Art. 30).

Regarding the procedure for making claims, the Convention refers only to the fact that from the time of making a claim there accrues a right for the claimant to receive an amount of 5 per cent per annum (of the value of the claim) and that a written claim suspends the period of restriction (Art. 32, Para.2). This latter rule is justified and useful, however, the absence of strict periods for making claims and their consideration can seriously hinder the application. It should be noted that when Soviet organizations participate in a contract of carriage their relations are subject to the rules of subsidiarily applied Soviet law as regards the necessity and specified time-limits within which to make and consider claims.

The period of limitation for an action arising out of carriage under the Convention shall be one year, while in the case of wilful misconduct, or such default which is considered as equivalent to misconduct, the period of limitation shall be three years. These periods are applicable to claims by owners of the goods and carriers. Moreover, by virtue of Art. 32 Para. 3 of the Convention in respect of claim periods the laws of the country where the court or tribunal is held shall be valid.

If the disputes arising out of carriage cannot be settled by the parties themselves, the competent body to handle the matter is the court (Art. 31). At present disputes affecting Soviet organizations arising out of international carriage by

road are settled by State Arbitration Courts. In future, under the provisions of the Convention, such disputes shall be brought before the court as is usual with the international carriage of goods by rail and air undertaken on the basis of relevant agreements.

The Convention gives an alternative legal jurisdiction as other transportation conventions do. A claim may be made in any one of the following courts: any court of a contracting country designated by agreement between the parties; the court of a country within whose territory the defendant is ordinarily resident, or has his principal place of business, or the branch or agency through which the contract of carriage was made; the court in the country where the goods were accepted by the carrier or where the place designated for delivery is situated.

By virtue of Art. 33 the contract of carriage may contain a clause conferring competence on an arbitration tribunal if such a clause provides that the tribunal shall apply the provisions of the Convention. Insofar as the consideration of foreign trade disputes in a court of arbitration has gained wide recognition and is a justifiable practice, Soviet road transport organizations are in a position to use this provision of the Convention and include a reservation in the consignment note that provides for disputes to be considered by arbitration tribunal in the country where the carrier is located.

Such are the main provisions of the 1956 Convention on the Contract for the International Carriage of Goods by Road. In spite of the fact that it contains a detailed system of norms regulating the terms of international carriage by road, some of these terms, above all those concerning the acceptance and delivery of goods, are insufficiently regulated by the Convention. For the solution of these and some other questions of practical importance recourse to national law is necessary as is also done in the case with other foreign trade transactions.

The Convention does not contain any general collision norm to define the law to be applied. Under Soviet legislation such a collision norm is the law according to which the rights and duties of the parties to a foreign trade transaction are fixed by the laws of the place where the agreement was made, unless otherwise provided for in the agreement (Art. 126 of the Fundamentals of Civil Legislation of the USSR and

Union republics). The Basic Conditions for the International Carriage of Goods by Soviet Road Transport of September 5, 1969, however, envisage a different rule for Soviet carriers: the carriers and goods owners shall be guided by Soviet internal legislation (Para. 33), i.e., the law of the carrier's country shall operate.

This latter rule is more in line with the present practice of international carriage and it should be maintained in future. In one instance, however, it can prove inconvenient and vague. Whenever goods are delivered to third countries the foreign consignees will naturally be guided by their own law, and the law of the carrier's country may in some cases prove impracticable. For this reason, in the delivery of goods, in particular as regards the evidence produced, note should be taken of the laws operant in the country where the goods are delivered, as is envisaged for carriage by sea under Art. 293, Part I of the USSR Code of Sea Navigation.

The accession of the USSR to the 1956 Convention on the Contract for the International Carriage of Goods by Road presupposes specification and amplification of some acts and norms of Soviet legislation on international carriage by road. First of all there is need to renovate the Basic Conditions for the International Carriage of Goods by Soviet Road Transport of September 5, 1969, which should now not only more fully reflect the relevant clauses of the Convention but also contain provisions on questions which are still open in the Convention and as such are therefore subject to national law. The articles of the Soviet law of procedure should be supplemented with a provision to effect that disputes arising out of the international carriage of goods by road, just as disputes arising out of international carriage by rail and air should be legally settled. At the same time it is necessary to give greater publicity to materials explaining and analyzing the provisions of the Convention and the practice of their application in the USSR and abroad.

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[1] *Vedomosty Verkhovnogo Soveta SSSR*. 1983, No. 32, Art. 491. In adhering to the Convention a statement was made to the effect that Art. 46 contradicts the Declaration of the UN General Assembly on the Granting of Independence to the Colonial Countries and Peoples as well as a reservation in Art. 47 providing for the mandatory application of the jurisdiction of the International Court of Justice. The Convention has entered into force for the USSR.

[2] Most wide known is the article-by-article commentary by the West German jurist Wolfgang Muth (*Leitfaden zur CMR*), published several times between 1960 and 1980.

[3] The Convention, however, is inapplicable to carriage performed under the terms of any international postal convention, to funeral consignments, as well as furniture removal (Art. 1 Para. 4).

[4] The 1975 Customs Convention on the International Transport of Goods under Covers of TIR Carnets; the 1965 Agreement of the socialist countries on clearing customs formalities in the international carriage of goods by road; the 1972 Customs Convention concerning container traffic.

[5] For more detail about the Agreement see S.P. Artemyev, O. S. Smirnov, O.V.Sharonov, *International Carriage by Road*, Transport Publishers, Moscow, 1977, p. 76 (in Russian).

[6] An Additional Protocol to the Convention was signed in Geneva on July 5, 1978, which defines the limit of the carrier's liability in Special Drawing Rights (8.33 SDR per kg gross weight short). The Protocol was signed only by some of the parties to the Convention.

CSO: 1812/189

NEW FUEL TANKER TRAILER IN PRODUCTION AT URALSK PLANT

Moscow SEL'SKAYA ZHIZN' in Russian 19 Feb 84 p 2

[Article by Yu. Peshkov: "Uralsk Fuel Tanker"]

[Text] The shop gates open, and the latest large tanker, shining with a bright paint job, rolls into the factory yard. It is the fuel tanker whose production was undertaken by the Uralsk Repairs and Mechanical Plant.

Machinery operators all over the country have been waiting for this machine. It can transport in one run three to four times as much fuel as conventional tankers. We now have the proper roads for this and vehicles with the necessary power. The only thing lacking was specialized mobile container. Development of this container was undertaken by Uralsk machine builders and scientists of the Saratov branch of the Central Experimental-Design and Technological Bureau (TsOKTB) "Orgtekhsnab" of Gaskomselkhoztekhnika.

Many days, and sometimes nights as well, the enterprise's Chief Designer M. Rybalko and Chief Technologist Ye. Loktev pored over design sheets. They consulted with metallurgists, welding specialists, and workers. The result of the combined forces was the birth of a completely new design for vehicular fuel transport.

It is a unique overland tanker with a capacity of 17 cubic meters, featuring interior wave baffles and exterior expanders, pumping devices, and breather valves. The long tank is divided on the inside by a solid partition into two equal halves and mounted on the trailer base of a KamAZ truck.

A special shop was set up in the plant to manufacture the fuel tanker. Without waiting for remodeling to be completed, the workers began to produce the new machine there.

Having initiated (along with other enterprises of the oblast) republic competition to increase labor productivity and lower the prime cost of production, the plant's collective is searching out reserves for improving the technology of manufacturing fuel trucks. Thus, thanks to workers' efforts, the State Emblem of Quality was awarded to the breather valve.

The plant is increasing the production of fuel trucks. In the early days, just one vehicle was turned out in 24 hours, while now three at a time are produced. In a few weeks the capacity will increase to four.

"And the tempo will continue to increase constantly," says Director S. Suleymenov. "We want to determine our capabilities, and then come out with a counterplan--to produce no less than 1,000 fuel trucks in a year."

12255
CSO: 1829/242

DESIGNER ON TRENDS IN DIESEL TRUCK DEVELOPMENT

Moscow ZA RULEM in Russian No 3, Mar 84 pp 6-7

[Interview with Vladimir Konstantinovich Koshkin, chief designer for the Moscow Motor Vehicle Plant imeni Likhachev Association, by editorial staff: "Directed Toward Diesel Trucks"; date and place of interview not given]

> [Text] At the end of 1983 the Politburo of the CPSU Central Committee approved proposals by the USSR Council of Ministers on organizing the production of diesel trucks at ZIL [Motor Vehicle Plant imeni Likhachev] and GAZ [Gorkiy Motor Vehicle Plant]. When the report of this was published, the magazine started to receive letters from readers who were interested in the future diesel trucks. The editors have asked V. Koshkin, chief designer with the ZIL Association, to answer a series of questions pertaining to the development of the design for the new ZIL truck.

[Question] Vladimir Konstantinovich, what has been done so far in developing the new family of diesel ZILs?

[Answer] We started working on it eight years ago, as the plan for experimental design work called for. The base model was initially called the ZIL-169. Today the index ZIL-4331 is used for it. Altogether 33 experimental models have been manufactured and put through plant tests, including tests for design safety and tests in mountainous conditions in a hot climate and in the Far North. In 1980 the trucks passed acceptance tests and were recommended for production.

[Question] Will the plant obtain the engines for the ZIL-4331 family from another enterprise, or will it set up its own production of them?

[Answer] We will make our own diesel engines, model ZIL-645. A new branch of our plant is being built for this purpose in Yartsevo, Smolensk Oblast. The fuel apparatus? It will be delivered by another branch of our plant, which also must be built.

[Question] It seems that your plant began experiments with diesels back before the war.

[Answer] Yes, the first experiments date from the late '30s to early '40s. At that time a group of our designers under the direction of P. Smetannikov developed a model of the six-cylinder diesel, the ZIS-D7, which was not bad for that time. After the war it was modernized. But our plant did not have the production facilities to produce the MD7.

Then came the time of the V-shaped, eight-cylinder ZIL-645 diesel. Incidentally, we showed an experimental model of its as far back as the Avtoprom-77 [Automotive Industry-77] Exposition. The designers of this engine relied on the extensive design and technological experience that had been accumulated over 20 years in production of the ZIL-130 and ZIL-375 carburetor "eights."

[Question] Was the ZIL-645 developed not just as a replacement for these engines but also with a view to a future truck model?

[Answer] Yes, with a view to a future family. Precisely a family, and not just an individual vehicle. We faced the task of developing a design for standardized models of 12- to 14-ton trailer trucks. They included the base truck model ZIL-4331, which is a flatbed model designed to tow a trailer. Along with it, the family includes the ZIL-4421 truck tractor, an agricultural dump truck (ZIL-4506), a construction dump truck (ZIL-4507), and a chassis that can be outfitted with specialized bodies. In order to meet the economy's needs more fully, it is planned to produce modifications with three alternative wheel bases.

Vehicles in the future family are to be used mainly in trailer trucks. Therefore, in accordance with present requirements, the power reserve per ton of the trailer truck's total mass must be from seven to eight horsepower. And the mass of a ZIL-4331 with trailer is 23 tons when fully loaded. It follows that the power of the base engine model must be 185 horsepower.

[Question] But experience in the automotive industry indicates that trucks are kept in production for a fairly long time, sometimes 20 to 30 years. And during this period the need arises for engines of different power. What future provisions have been made along these lines for the ZIL-645?

[Answer] We already have a modification with a gas-turbine supercharger that is from 15 percent to 20 percent more powerful than the base model. In addition, we are also developing a six-cylinder version for truck models that do not pull trailers.

[Question] And now please describe the diesel's merits.

[Answer] In the first place, it used from 30 percent to 40 percent less petroleum fuel than a carburetor engine. You know that our plant, along with the Gorkiy plant, supplies the largest number of trucks to the economy. It is understandable that in developing a long-range model we should have provided the most economical power unit for it.

We chose the pellicular-volume method of fuel injection. Its merits include a smooth combustion process, a low noise level, good engine starting in subfreezing temperatures, and suitability for multifuel modifications.

The configuration of the ZIL-645 engine is traditional for common V-shaped engines. It is distinguished by its simplicity, and it provides for convenience of assembly and easy access to assemblies that require servicing.

[Question] Who designed the diesel?

[Answer] It was developed by plant designers, without the purchase of any foreign license or enlistment of help from foreign consultants. Of course, we thoroughly generalized the experience that had been gained in Soviet and foreign diesel design. We closely and, let me note, critically studied the best foreign models--such diesels as the American Cummins, Caterpillar and Detroit Diesel, the British Perkins, and the German Klokner-Humboldt-Deutz. In working out the design for the diesel we collaborated with specialists from the NAMI [Central Scientific Research Institute of Automobiles and Automobile Engines] MADI [Moscow Institute of Automobile Roads] and the plant's higher technical educational institution.

[Question] Judging from the design of the new truck family, the plant remained true to its traditional truck configuration, with the hood in front of the cab.

[Answer] With this sort of configuration, at least 70 percent of the entire truck mass falls on the rear wheels. Our trucks often operate on dirt roads, where a good load on the drive wheels is especially important.

Let me also note that the configuration we chose is also preferable both from the standpoint of passive safety and in terms of technological continuity in shifting production to the new family. Another important aspect is that the location of the engine in front of the cab is more familiar to the ordinary driver.

Incidentally, look at the examples of such well-known foreign plants as Daimler-Benz, Magirus-Deutz, MAN (FRG), Renault (France), Leyland (Great Britain), Volvo (Sweden) and Mack (USA). They all continue to produce trucks with the hood in front of the cab.

Incidentally, in speaking of the hood, on the trucks in the ZIL-4331 family we have combined it for the first time with the fenders and the radiator grill in an integral nose unit. It tilts forward, providing free access to the engine and its systems and assemblies, as well as to the steering and the front wheel suspension.

[Question] Yes, such a design significantly simplifies monitoring, adjustment, maintenance and repair. And what else is provided on the new ZILs to make the driver's work easier and improve his working conditions?

[Answer] A hydraulic steering booster, a hydraulically powered clutch with a pneumatic booster, and a pneumatic brake drive have all found application in the ZIL-4331 family. I would especially like to mention the cab and the

and the driver's work place. Up-to-date upholstery and finishing material, effective heating and ventillation, good sound insulation, a spring-mounted driver's seat with a contoured seat and back, cab shock absorbers, a steering column that is adjustable for height and angle of tilt, conveniently located instruments (including a tachometer)--all this creates the necessary comforts and conveniences that fully ensure the driver's ability to perform and a high degree of operating safety.

In the interests of operating safety, our new trucks are equipped with independent braking systems (for the front and rear wheels), reserve and emergency brakes, and an inhibiting baffle in the exhaust system. Let me also note in this connection light and signal instruments that meet all the requirements of international norms, and a double-spoked steering wheel with a heated hub.

[Question] In inspecting the cab, one notices that the gear shift provides not five speeds but eight.

[Answer] There is a clear trend in the world automotive industry today toward transmissions with an increased number of speeds. We have not avoided it and have employed a so-called dual-range gear box with a planetary supplementary gear box. It doubles the number of speeds in the main gear box.

Why is this necessary? The great variety of chassis and engine modifications provide combinations that make for a wide range of operations in terms of the load placed on the engine. Therefore, the transmission should give the driver the possibility of choosing the most advantageous gear ratio for any operating condition, i.e., the most advantageous ratio in terms of speed of motion, pulling strength and economy. The result of using an eight-speed transmission is to increase the average running speed of the trucks in the ZIL-4331 family by 10 percent (in comparison to the ZIL-130 family).

[Question] As far as economy is concerned, how does the new family rate as a whole?

[Answer] For the ZIL-4331 base model we maintained the same load capacity as for the ZIL-130: six tons. The load capacity of towed trailers has been increased from six to eight tons. Thus, the truck's productivity has increased. Add to this a reduction in the unit-cost of hauls thanks to the use of the diesel engine and the multispeed transmission.

But even this is not all. The distance of operation before a major overhaul has been increased to 400,000 km for the new truck family. The labor-intensiveness of servicing has been significantly reduced. Here are some figures: the interval between No. 1 service stops has been increased to 4,000 km, and the distance between No. 2 service stops has been increased to 16,000 km. In comparison to the ZIL-130, the number of lubrication points has been reduced from 53 to 35 (including a reduction of grease nipples from 29 to 15). On the whole, the labor-intensiveness of servicing the new truck has been cut to 1.5 man-hours per 1,000 km of operation, and the labor-intensiveness of routine maintenance has been cut to 4.0 man-hours.

If you sum up the economic effect obtained from all the aforementioned factors, it becomes clear that the annual productivity of a ZIL-4331 with trailer is 50 percent higher than that of a comparable trailer truck based on a ZIL-130. Moreover, and this is very important in itself, fuel consumption per 1,000 km has been reduced by 45 percent. There is the real gain from putting our diesel trucks to use in transport.

[Question] And when is it planned to begin their series production?

[Answer] Right now the construction of the ZIL branch plants is under way, and new body and pressing buildings are under construction at the head enterprise. At the same time, production equipment is being ordered. It is planned to complete work during the 12th Five-Year Plan and start producing the new diesel trucks in 1986-1988--first the ZIL-4331 models with a 4,500mm base, and then the remaining modifications.

8756
CSO: 1829/238

MOTOR VEHICLES AND HIGHWAYS

RECENT HIGHWAY CONSTRUCTION PROJECTS CHRONICLED

Moscow ZA RULEM in Russian No 3, Mar 84 p 12

[Series of listings of recent highway construction projects, under rubric: "Highway Chronicle"]

[Text] Construction has begun on a highway from Sharya, a major railway-junction station and rayon center in Kostroma Oblast, to the border of Gorkiy Oblast. The road will be 58 km long, and it will become part of the republic-level Uren-Sharya-Nikolsk-Kotlas Highway, which will pass through the territory of four large oblasts in the Non-Chernozem Zone: Gorkiy, Kostroma, Vologda and Arkhangelsk.

The first 13 kilometers of the asphalt-concrete highway that is under construction are scheduled to be open for traffic in 1984. The collective of the Kostroma Bridge-Building Administration No. 16 is working along with the road builders there. It is building a 350-meter steel and reinforced-concrete bridge across the Vetluga River.

Until recently the collective farms and state farms in Ternovskiy Rayon and part of the farms in Ertilskiy Rayon, Voronezh Oblast, have been compelled because of impassable roads to haul the sugar beets grown on their lands to a processing plant in Tambov Oblast. In two years a 60-km asphalt-concrete road has been built there that joins the Voronezh Oblast rayon centers of Ertil and Ternovskiy. Now these rayons' farms have dependable motor connections during any season with the nearest sugar plant, which is located in the rayon center of Ertil.

Reconstruction has begun on the republic-level highway that connects Saransk, capital of the Mordovian ASSR, with the rayon center of Krasnoslobodsk. When work on the first section of this highway, from Saransk to Novotroitsk, is completed in 1984, five agricultural rayons will have dependable connections with neighboring Ulyanovsk Oblast, since a road has already been built from Saransk to this province's border.

Construction work is being completed on a bypass around Saratov. The 34-km highway will bypass the city along the right bank of the Volga. Builders have set up a sizeable production base near the settlement of Yeremeyevka.

An asphalt-concrete plant capable of producing 50 tons of mix per hour and two cement-concrete plants have been set up there.

In 1983 the new bypass was opened to limited traffic on a trial basis. And when the man-made installations along the entire 34-km semicircle around Saratov are opened for use, the new road will take on the entire flow of through traffic. As a result, the traffic inside the city will diminish significantly, noise will decrease, and the air will become cleaner. Not just Saratov residents but all drivers will benefit. The new first-class highway with modern viaducts and grade separations will allow them to develop high speed and save time in transit and will provide for traffic safety and comfort.

A new 47-km highway from the oblast center of Lipetsk to the Peskovatka rail station has been opened to traffic. It is part of the republic-level Orel-Tambov Highway and is a bypass of Lipetsk that makes it possible for through traffic to circumvent the busy streets of this major industrial city. Despite the new highway section's relatively small length, a whole series of rather complex engineering installations have been built on it: a 350-meter highway bridge across the Voronezh River and seven viaducts.

Subdivisions of the USSR Ministry of Transport Construction's Dondorstroy [approximate expansion: Donets Oblast Highway Construction Trust] are completing construction of a highway bypass of the city of Bataysk in Rostov Oblast. This asphalt-concrete highway, only 14.5 km long, will solve a serious transportation problem. The union-level highway connecting Rostov-on-Don and Baku passes through Bataysk, and as is known, it is one of the busiest tourist routes. With the opening of the bypass, passage on this section will be made substantially easier, and the streets of Bataysk will cease to experience traffic jams created by through transport. Nine bridges and viaducts, as well as tunnels, had to be built on the route.

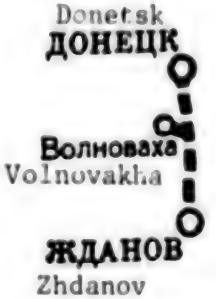
A new asphalt-concrete route connecting Izhevsk, capital of the Udmurt ASSR, with the border of the Tatar ASSR has been opened for traffic by Rosdortsentr [approximate expansion: Central Russian Highway Construction Trust] of the RSFSR Ministry of Highways. The length of this republic-level route is 135 km. From the border of the Tatar ASSR to the rayon center of Yelabuga, its construction is being continued by subdivisions of the USSR Ministry of Transport Construction. They have already completed 31 of the 34 km on their section. The

Izhevsk-Yelabuga Highway will provide Udmurtiya with a more convenient connection with Moscow via the republic-level Ufa-Kazan Highway.

Workers of the Ukrainian SSR Ministry of Highway Construction and Maintenance and the USSR Ministry of Transport Construction have built the Kiev-Kovel--State Border Highway, which is more than 500 km long, through dense forests and impassable swamps, across rivers, and around many cities and villages. The highway links industrial and cultural centers in Kiev, Zhitomir, Rovno and Volyn oblasts and has become the shortest route from Kiev to the fraternal countries. This route, which gladdens the eye with its picturesque surroundings, is well provided with well-outfitted parking areas for vehicles, rest areas, gas pumps and service stations.

It was fairly difficult to build the "Warsaw link," as the road is still often called. During the '60s only some sections of it were paved. Intensive work did not begin until the late '70s, following the establishment of the Ukrainian SSR Ministry of Highway Construction and Maintenance. Contract organizations of the USSR Ministry of Highway Construction and the republic Ukrdorstroy [Ukrainian Highway Construction] Association carried out extensive irrigation work, laid 3.5 million cubic meters of earth and built more than 1,000 running meters of bridges and viaducts. Now it is a union-level main highway, and many drivers who have driven it have already given it high marks for safety and convenience.

With the opening of a dual-level grade separation near the city of Volnovakha, Donetsk Oblast, reconstruction work has been completed on the 97-km Donetsk-Zhdanov Highway. The work has been done by the Ukrainian SSR Ministry of Highway Construction and Maintenance's Donbassdorstroy [Donets Basin Highway Construction] and Ukrdormostostroy [Ukrainian SSR Highway and Bridge Construction] trusts, as well as by the USSR Ministry of Transport Construction's Bridge Construction Detachment No. 33.



Prior to reconstruction, this highway with a narrow traffic area, numerous grade crossings and an increasingly heavy traffic flow was not meeting present-day requirements. Now the highway conforms completely to the

parameters of a first-class highway. The traffic area has two lanes for traffic in either direction and a center divider. Grade separations, high-speed passing lanes and overpasses provide safe conditions for high-speed traffic. The glass-bead road markings used along the entire highway are highly visible at night and in fog. The high embankments have the necessary road barriers. The broad shoulders are reinforced with stone materials. In order to provide for pedestrian safety and convenience, underground crossings have been built in the settlement of Yelenovka,in Volnovakha, and at the Krinitsa Rest Area.

Last year a transport tunnel was built connecting Kanonerskiy Island in Leningrad with one of the city's rayons. This one-km submarine tunnel was built on the basis of the comprehensive plan for the city's economic and social development, which provides for the steady improvement of its road system.

8756
CSO: 1829/238

CODING SYSTEM FOR AUTOMOBILE TIRES EXPLAINED

Moscow ZA RULEM in Russian No 3, Mar 84 pp 26-27

[Article under rubric, "Motorist Club," by V. Kalinkovskiy, engineer and specialist with Tire Industry Research Institute: "Tire Geography"]

[Text] Our country's industry produces tens of millions of motor vehicle tires annually. A good many of them are tires for passenger cars. With numerous sizes and with normal and winter, all-purpose and off-the-road treads, these tires are suitable for various loads and speeds and are manufactured for vehicles of all makes and models.

How can one tell where a tire has been made, what its performance characteristics are, and what sort of wheel it can be mounted on? These questions are frequently raised in letters from ZA RULEM's readers. We asked V. Kalinkovskiy, an engineer and specialist with the Tire Industry Research Institute, to answer them.

The fact that such questions are asked is the natural result of the expansion of the geography and scale of tire production. The number of enterprises producing tires has already risen to 18, and tire models for passenger cars alone number in the dozens. In recent years several plants have changed their trademarks, and tires of the same model that have been made in molds of different years may have different markings. The trademarks of the tire-industry enterprises shown below will help motorists sort out these changes; in addition, Table 1 shows the precise name of each enterprise, its postal index (the city in which it is located is clear from its name), and the letter index that is included in the tire markings to designate the manufacturer.

The trademark and letter index of an enterprise are mandatory symbols that are present on each tire in the passport, so to speak, that is printed on its side. We have already given a detailed account of all the inscriptions and signs that are placed on tires in accordance with the state standards for passenger-car tires (ZA RULEM, 1982, No. 9). Let us recall that a tire manufacturer's trademark always stands separately in order to keep it from being confused with the other information. The letter index, on the other hand, is included in the numerical block that tells the place and time of manufacture and the

tire's sequential number. This information is placed on the tire during the vulcanization process by means of imprinting with a special tag.

On tires made in old molds, the numerical block may, for example, look like this: YaIV83402101. This inscription can be deciphered as follows: the Ya is the Yaroslavl Tire Plant's letter index; IV is the month of manufacture (April); 83 are the last two digits in the year of manufacture (1983); and 402101 is the tire's sequential number. In accordance with the requirements of state standard 4754-80, which has been in effect since 1981, the block containing this information may also have a different appearance, such as the following: 163Ya402101. In this case the date of manufacture comes first: 163, which is deciphered as the sequential number of the week (16) and the last digit of the year (3,i.e., 1983); then the letter index (Ya), which is already familiar, followed by the tire's sequential number. This information is sufficient to determine the manufacturer's address and, at the plant, to tell who made the tire and in which work place it was made. The need for this information may arise during the tire's warranty period.

In order that a motorist can make sense of the assortment of tires when buying them for his car, Table 2 provides information that is not contained in a vehicle's operating manual. Special attention must be paid here to such parameters as the shape of the rim, the economical load and the maximum allowable speed for a tire.

Not all tires with the same diameter can be placed on rims with contours of different widths. There are restrictions here, and the table gives both the recommended and allowable magnitudes. Rims with contours of other sizes are not suitable for a given tire model.

The longevity of a tire depends to a considerable extent on the load per wheel. An overloaded tire is subjected to increased heat and mechanical pressure, which is capable of destroying its carcass. Therefore, tires with lower than the recommended load rating should never be used on a car. It is easy to determine the load that will be on each wheel. All that is needed is to locate in the operating manual the full weight of the vehicle, which is distributed between the front and rear axles, and then divide this in half.

Among motorists there is a popular belief that wheels should not be rotated. It is based on the assumption that it is better to wear out one pair of tires rapidly than to wear out all five gradually. It is known that in everyday use a car is rarely fully loaded. Usually it carries only the driver or one additional passenger. Therefore, the front wheels operate almost all the time with a greater load and, naturally, their tires wear out faster. Many people get used to this, and sometimes they get so used to it that they quit checking their wheel alignment, thereby even increasing the speed with which the forward-mounted tires wear out.

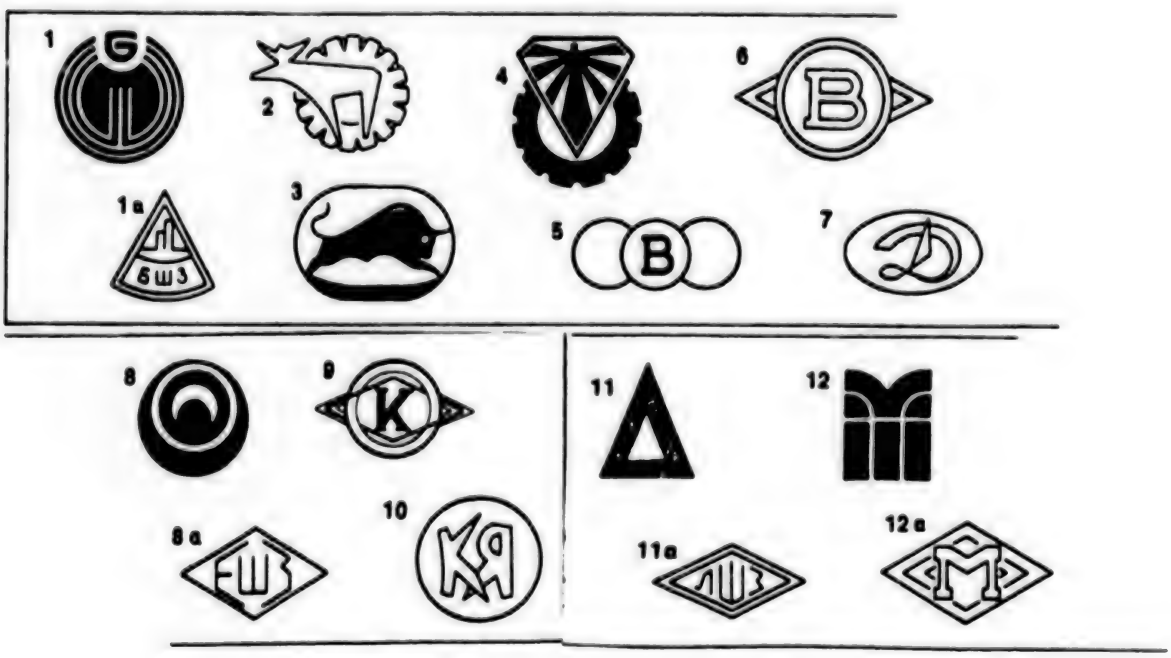
The third serious parameter is maximum allowable speed. We decided to include a reminder of it in connection with the widespread practice of using IV-167 off-the-road tires, which are intended for LuAZ [Lutsk Motor Vehicle Plant]

vehicles, on Zhigulis and Moskviches. The Zhigulis and Moskviches, which greatly exceed the LuAZ all-terrain vehicles in terms of engine power, dynamics and maximum speed, lose their usual stability when operating with these tires on good roads, and the tires themselves wear out much faster than their rated operating life. The heavier and coarser all-terrain tires do not have the best effect on the longevity of the half-axle bearings, or of the entire transmission, for that matter, not to mention the fact that they encourage drivers to drive in mud for which the cars are unsuited and where the driver of a normally equipped Zhiguli would not even think of driving. The external effect of off-the-road driving on such a vehicle will inevitably be an extremely fast deterioration of the universal joints, suspension and other assemblies and parts of the undercarriage.

Drivers of Niva vehicles who use tires on them that are intended for GAZ [Gorkiy Motor Vehicle Plant]-69 or Pobeda vehicles should also think about allowable speed and tire weight.

Table 2 indicates extremely high maximum allowable speeds for winter tires. This pertains not just to "plain" tires but to studded tires as well. In this case, if the car owner has installed studded tires on his car, the studs limit the speed. It should not exceed 130 km/hour. In this connection, one must also take into account another important circumstance: Studded tires should be run in at a speed of no more than 80 km/hour. The longer and more precisely they are broken in, the better the studs will perform.

Tire Trademarks



Tire Trademarks, cont.

Note: Illustrations whose numbers contain the letter "a" depict trademarks of the appropriate enterprises that may be found on tires manufactured in old molds.

Table 1

Trademark number in illustration	Name of enterprise	Letter index on plant's tire number	Enterprise postal index
1,1a	Baku Tire Plant	B	370033
2	Barnaul Tire Plant	Br	656048
3	Bobruysk Tire Production Association	Bel	213824
4	Belotserkovskiy Tire, Rubber and Asbestos Products Production Association	Bts/	256414
5	Volga Tire Plant	Vl	404103
6	Voronezh Tire Plant	V	394034
7	Dnepr Tire Production Association	D	320604
8	Yerevan Tire Plant	Ye	375200
9	Kirov Tire Plant	K	610004
10	Krasnoyarsk Tire Plant	Kya	660014
11,11a	Leningrad Red Triangle Production Association	L	188020
12,12a	Moscow Tire Plant	M	109088
13	Nizhnekamsk Tire Production Association	Nk	423550
14	Omsk Tire Production Association	O	644018
15	Tire Industry Research Institute's Experimental Tire Plant	Op	105118
16,16a	Sverdlovsk Tire Plant	S	620087
17	Chimkent Tire Production Association	Ch	486025
18	Yaroslavl Tire Plant	Ya	150040

Table 2

Tire designation	Model	Tread type	Rim contour designation recommended / allowable	Economical load & pressure load kg-force	pres. kg-force/cm^2	Max allowable speed km/hr	Tire mass kg (max)
130-330/5.20-13	V-67B	standard	102J (4J)	275	1.8	100	9.0
5.90-13	IV-167	off-road	102J (4J) / 114J (4½J)	380	1.8	95	11.0
6.00-13(155-330)	M-107	standard	102J (4J)	330	1.8	125	9.6
155-13/6.15-13	I-151	"	114J (4½J) / 102J (4J)	370	1.9	150	7.7
155-13/6.15-13	IYa-143	winter	"	370	1.9	150	8.1
6.40-13	M-100	standard	114J (4½J) / 127J (5J)	450	2.2	140	12.0
165-13/6.45-13	AI-168	winter					9.5
	M-145	standard					9.0
	M-130A	"	"	370	1.7	150	9.0
	M-177	winter					9.5
175-13/6.95-13	M-154	standard	127J (5J)	415	1.7	150	9.8
165R13 (165/82R13)	IYa-170	standard	127J (5J) / 114J (4½J)	410	1.9	160	8.6
165/80R13	MI-166	"	114J (4½J) / 102J (4J)	410	2.0	180	8.5 (to 1/1/82)
			127J (5J) / 140J (5½J)				7.9 (since 1/1/82)
175/70R13	IN-251	standard	127J (5J) / 140J (5½J) / 114J (4½J) / 152J (6J)	405	2.0	180	8.3
185-14/7.35-14	AID-23	winter	127J (5J)	485	1.7	150	12.5
			"	560	2.1	150	13.7
	ID-195	standard	"	485	1.7	160	11.8
			"	560	2.1	150	13.2
205/70R14	ID-220	"	140J (5½J) / 152J (6J)	580	2.1	180	13.0
5.60-15(145-380)	M-59A	"	114J (4½J)	330	1.7	115	10.4

Table 2, cont.

Tire designation	Model	Tread type	Rim contour designation recommended / allowable	Economical load & pressure: load kg-force	Economical load & pressure: pres. kg-force/cm^2	Max allowable speed km/hr	Tire mass kg (max)
6.40-15	M-51	off-road	114K (4½K)	360	1.7	90	13.50
6.70-15(170-380)	I-194	standard	127K (5K)	505	1.8	130	14.4
7.00-15	I-89	"	152L (6L)	605	2.5	125	18.7
7.10-15(180-380)	Ya-259A	"	127K (5K) / 152L (6L)	590	2.1	125	18.5
8.20-15(210-380)	Ya-201	standard	152L (6L) / 127K (5K)	705	2.0	150	17.5
8.20-15(210-380)	Ya-153A	"	"	660	1.8	"	"
8.20-15(210-380)	I-L95	winter	152L (6L)	705	2.0	150	19.0
8.40-15	Ya-192	off-road	"	770	2.6	100	26.0
8.40-15	Ya-245	all-purpose	"	770	2.6	100	24.0
185/82R15 (185R15)	Ya-288	standard	140J (5½J) / 127K (5K)	735 / 720	3.9 / 3.8	120	17.0
9.35-15 (235-380)	I-L126	"	152L (6L)	750	1.7	175	18.0
	I-L137	winter	"			130	19.5
	I-137	"	"			150 (unstudded)	(unstudded)
9.35-15(235-380)	I-126	standard	178L (7L)	1,090	2.3	190 (w/960 kg-force load)	20
245/78-15	I-240	"	178L (7L)	1,090	2.3	200 (w/980 kg-force load)	18.5
6.00-16	I-77 I-77Ye	"	102E(4.00E)	460	2.2	105	14.7
6.50-16	Ya-101	off-road	114E(4.50E)	655	2.7	90	22.0
6.50-16	Ya-248	all-purpose	"	655	2.7	95	22.0
175-16/6.95-16	V1I-5	"	127J (5J)	425	1.7	150	12.0

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BRIEFS

ENGINE RESTORATION IMPROVED--The wheels of a ZIL turn for many thousands of kilometers before its engine is worn out. Then--repairs, and back on the road for years to come. Nevertheless, the restored "heart" of the truck gives significantly less service than a new one. Can we increase this time, prolong the work life of the engine and truck? The resolution of these tasks was undertaken by specialists at the Auto Plant imeni I. A. Likhachev. Today, after three years' experimental use, the enterprise has converted to trucks whose power units have been restored using a new technological process. In repairing motors, widespread use has been made of modern methods of hardening parts, plasma spraying of the metal in damaged places, electron-beam welding, and galvinization. It has become possible to restore cardan shafts and cylinder blocks. Leading sectorial institutes and scientists of the Institute of Electric Welding imeni Ye. O. Paton participated in developing the new method. The life of the motor is more than doubled and the total mileage of the truck comes to 540,000 kilometers. [Text] [Moscow VECHERNYAYA MOSKVA in Russian 14 Mar 84 p 1] 12255

NEW HEAVY-WEIGHT TRUCK PRODUCED--MIASS-a great contribution toward creating a new make of heavy-weight truck for the farm has been made by collectives of the Uralavtostroy and Vostokmetallurgmontazh trusts. They have completed 10,000 square meters of production space at the Uralsk Auto Plant. The first Ural-5557 trucks have been sent to many areas of the country. And at the enterprise, the work continues. It is planned to raise the production of high-capacity vehicles to 3,000 per year. The work is proceeding in accordance with the start-up schedule. The adoption of advanced labor methods is contributing to this. [By L. Mikhaylov) [Text] [Moscow STROITEL'NAYA GAZETA in Russian 21 Mar 84 p 2] 12255

NEW TRUCK MODELS--The Kremenchug Association for the Production of Heavy-Weight Trucks has begun series production of new models of all-purpose trucks. These are saddle tractors and also multi-purpose chassis on which can be mounted powerful hoisting cranes, oil derricks, power shovels, and other equipment. The new all-terrain vehicles have three drive shafts and high-power motors. In future plans AvtoKrAZ is to organize production of a number of other new models of trucks: high-speed 16-ton all-terrain dumpers, dumping tractor and trailer rigs which can unload on three sides, and 30-ton lumber trucks. [Text] [Vilnius SOVETSKAYA LITVA in Russian 25 Mar 84 p 47] 12255

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DETAILS OF NEW 4TE130 DIESEL LOCOMOTIVE

Moscow ELEKTRICHESKAYA I TEPLOVOZNAYA TYAGA in Russian No 1, Jan 84 pp 35-37

[Article by S. P. Filonov, A. I. Gibalov, N. M. Naysh, and V. A. Naumenko of the Voroshilovgrad Diesel Locomotive Industrial Association: "Diesel Locomotive 4TE130" under the heading: "New Equipment". Passages enclosed in slantlines printed in bold face]

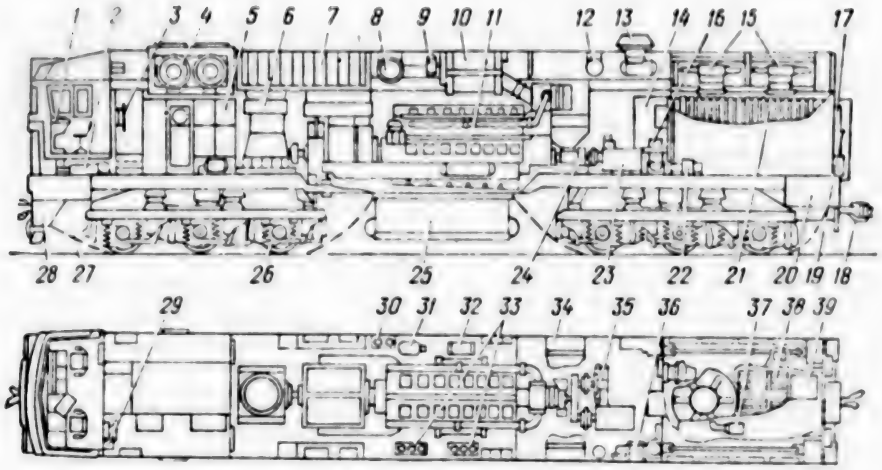
[Text] The Voroshilovgradteplovoz Industrial Association in cooperation with the Kharkov Elektrotyazhmash [Electric Traction Machinery] plant designed, and in 1982, built the four-section 4TE130 locomotive. The 12,000 horsepower developed by four diesel engines permits pulling freight trains having weights from 6800 to 9600 tons on a 19 percent grade.

The locomotive consists of four sections, two end sections and two middle sections. They all have a cabin with a control console. The end sections have a control for four sections, and the middle sections have a control for two sections. The locomotive can thus operate with one, two, three, or four sections. For passage of the locomotive crews into the ends of the sections, treadplate platforms are provided with balloon-type vestibules.

The design of the locomotive's structure above the carriages is unified to the maximum extent with that of the 4000-hp 2TE121 locomotive which was the base model. In so doing, advanced and fundamentally new subassemblies, designed mainly in blocks, have been used. (See illustration)

The 2V-9DG diesel-generator unit (11) [numbers in parentheses refer to those in illustration] contains a modified 16ChN 26/26 diesel engine. It has a steel crankshaft with widened and thickened bearing inserts, steel cylinder jackets, and a number of the other improvements which have been made to diesels of the D49 type. The single-bodied A714 UKhL2 traction generator unit consists of synchronous traction and auxiliary generators and a UVKT-9 rectifier installation.

The direct-current ED125B UKhL1 traction motor provides lubrication for the motor axle bearings by means of a gear-type pump driven by a gear secured to the axle of a pair of wheels. The centralized system of air supply [TsVS] (6) is for cooling the traction generator and rectifier unit, the traction motors, the batteries, and the electron automation devices.



Arrangement of principal equipment on a section of the 4TE130 diesel-electric locomotive.

1- control console, 2- heating and ventilating unit, 3- hand brake, 4- electrodynamic brake, 5- high-voltage compartment, 6- fan for TsVS, 7- air cleaner cassettes, 8- foam fire extinguishing installation, 9- air-dryer unit, 10- muffler, 11- diesel-generator, 12- water tank, 13- body ventilator, 14- braking apparatus, 15- motor driven fans of engine cooling chamber, 16-reheating boiler, 17- bunker for sanders, 18- automatic couplings, 19- entry vestibule, 20- battery recess, 21- cooling sections, 22- lubricating oil circulating unit, 23- starter-generator, 24- reduction gear, 25- fuel tank, 26- carriage, 27- sander pipe, 28- track cleaner, 29- foam generator, 30- coarse fuel filter, 31- fuel pump unit, 32- fuel preheater, 33- fine fuel filter, 34- air cleaner, 35- compressor, 36- lubricating oil pump unit, 37- water pump, 38- upper louvers, 39- head.

The electrodynamic brake (4) automatically maintains the ordered down-grade speed. The unitized system for drying compressed air (9) prevents condensation of water vapor in the pneumatic system and does not allow the ingress of moisture or oil into the brake lines or instruments.

The locomotive is equipped with a foam and a gas fire extinguishing system (8). A unitized, removeable, capsule-like cabin for the engineer is secured on rubber mounts and has a electric air-heater.

The diesel's cooling system automatically maintains the required temperature of the cooling water and the lubricating oil for the power plant. The motor driven ventilation fans (15) with rotatable blades and a recirculating system provides for warming the radiator sections and the machinery compartment in winter time.

The wholly unitized body is made of low-alloy steel and the roof units are made of rolled aluminum. The strength of the automatic couplings (18) which have absorbers has been increased. The system for automatic temperature regulation was manufactured from standardized pneumatic automation elements (USEPPA [General-purpose System of Elements for Industrial Pneumatic Automation]). There is a system for automatic warm-up at stops and during

movement as a spare engine. There is a remote fuel measuring device and an effective muffler (10) of exhaust noise with an injector and compensator.

The heat insulation of all systems on the locomotive has been reinforced and a heating and ventilating system with increased heat output has been installed. Also used is electric warming of the water-draining devices of the air-brake reservoirs. The braking apparatus (14) is in the machinery compartment.

To provide for operating many units as a system, at the ends of the bodies of the sections within the vestibule passages receptacles are installed for the interlocomotive connection of low-voltage control system circuits, high-voltage circuits for the electric heating systems of nonoperating sections, and circuits for the parallel connection of batteries.

/The body/ It is a unitized structure of the braceless type made of the low-alloy steels 0912 and 09G2SD. Structurally the body is divided into the main frame, two side walls, the cooling chamber, and the removeable cabin capsule. According to the accomodation of equipment, the body consists of four compartments; namely, the control cabin, the high-voltage chamber with the electrical equipment, the built-into-the-roof electrodynamic brake, and the machinery compartment with cooler chamber. Underneath the frame of the body, the removeable fuel tank is secured with bolts.

The frame of the locomotive is used as a conduit for delivering air from the fans of the central air supply [TsVS] to the electrical machinery and apparatus. At the ends of the frame four recesses for batteries are disposed (20). Along the edges of the frame for the whole of its length, C-shaped brackets are welded on having 400 mm height and 160 mm width. In them the power cables for the traction motors and the wires for the control system are arranged.

The sides of the body are of the panel type made of 2.5 mm thick plates and connected together only by longitudinal Z-bars by contact welding.

All of the roofing units for the body are removeable, including those over the cooling chamber. They are of unitized design, and made of rolled aluminum. Each roof unit is made with due regard for the accommodation, and securing within it, of units of auxiliary equipment.

Welded to the forward parts of the end sections are strong end wall fairings to prevent damage to the removeable cabin capsule and to provide safety for the crew. The internal space in the fairing is used as a sand bunker.

The main distinguishing feature of the new cabin capsule is that it is an independent, fully assembled unit. It is secured to the body by four conical mounts in a plane passing through the center of gravity of the cabin. The mounts absorb all kinds of loadings and reliably protect the cabin from the penetration of noise and vibration. The noise level in the cabin is significantly below the established norm.

The temperature in the cabin is maintained automatically by an electric air-heater whose fan has two operating modes: normal and forced.

The control console is designed so that the engineer can control the locomotive sitting down or standing up. The control instruments necessary to the running of the train are situated on the console in a zone convenient for use, and they are broken down into functional groups. Indicating instruments which are used before starting and sometimes when the locomotive is moving, are mounted on the back wall of the cabin behind the engineer. A signal lamp warning about a malfunction in any section is situated on the console. For deciphering this signal, there is a signal display above the windshield under the ceiling of the cabin.

The new cabin meets the specifications of GOST [State Standard] 12.02.056-81. It underwent interdepartmental tests of the 2TE121 locomotive and it provides maximum comfort for the crew.

/Undercarriage/ On the locomotive, the three-axle, jawless, standard carriages on the TE10M and 2TE116 locomotives are used. The carriage frame and the brake linkage are made of 09I2C low-alloy steel which has greater strength and resistance to cold compared to St3sp steel of which standard carriages are made.

The standard brake cylinders have been replaced by new ones which automatically adjust the movement of the brake rod for brake shoe wear without manual adjustment of the brake linkage. More reliable ED125B UKhL1 traction motors are used having a forced lubrication system for the motor journal bearings which increases reliability of operation of the wheel-and-motor unit and reduces expenditures for servicing and repair.

/Locomotive systems/ The closed-type diesel water cooling system operates at excess pressure as a result of the natural formation of steam. Two independent loops are used for the separate regulation of the water and lubricating oil temperatures; namely, a hot loop for cooling the cylinders of the diesel, the turbo-compressor, and the exhaust collectors, and a cold loop for cooling the lubricating oil and the air from the turbo-compressor. In the hot loop water is cooled in 14 standard air-cooled radiators, and in the cold loop, in 28 of them.

Each loop is served by its own impeller-type water pump and electrically driven ventilation fan with rotatable blades automatically controlled by an electropneumatic temperature control system (SART). In the cold time of year, hot water from the diesel is used to heat fuel in a duplex fuel preheater and also to heat the water in the tank for the sanitary facility.

A distinctive feature of the water system is the introduction of a heating loop with a 90 kW electric preheating boiler (KPZh) (16). It is powered by the auxiliary generator of one of the operating sections of the locomotive, or, during a layover of the locomotive at a depot, from an external source. Water is circulated in the system by an electrically driven pump.

The electric preheating boiler is controlled automatically by sensors installed in the water and lubricating oil piping. During operation of the heating loop, oil is heated in heat exchangers through which water from the KP/h passes and fuel is heated in the special preheater. A cellular filter is installed in each loop to prevent blockage.

The lubricating system consists of piping delivering lubricating oil to a full-flow fine filter (FTOMP) and to the lubricating oil pumping unit (22). The latter is turned on automatically when the diesel stops and assures lubricating oil circulation in the diesel. The reduction gear for the fan of the ventilation system (6), and the drive for the compressor and the starter-generator (23) are lubricated from this system. The necessary amount of lubricating oil is assured by a throttle-plate installation. Lubricating oil from the reduction gears is discharged into the engine crankcase by gravity.

All the piping of the water and lubricating oil systems is thermally insulated. To reduce vibrations, they are connected to the diesel by special resilient compensators instead of durite connections. Such construction assures the reliability and prolonged endurance of these subassemblies.

The cooling system for the diesel occupies the after part of the body of the locomotive. A feature of the design of the cooler is an inclined position for the radiator sections moved away from the sides of the body. In the space between the side of the body and the radiator sections, adjustable shutters having an electropneumatic drive are situated.

In the lower, open position of the shutters air is sucked through the radiators by the electric fans and discharged upward through open roof louvers. In the cold time of the year, the adjustable shutters shut the outside-air inlet and simultaneously open apertures in the lower part of the sump of the cooler casing through which air from the machinery space is fed to the radiators. The air is then directed through specially provided hatches having hinged shutters into the body of the machinery space (the roof louvers are closed), and is thereby recirculated.

The adjustable shutters have an intermediate position where part of the air fed to the radiators is from outside and part from the engine room. The warming shutters with manual drives usually installed on the air intake apertures are not provided because their role is fulfilled by the adjustable shutters having automatic and manual-remote control from the console of the main section. The apertures of the cooler for the intake of outside air are welded, sturdy, decorative lattices.

/Drives of the auxiliary units/ A special, right-angle, step-up reduction gear driven from the shaft of the traction generator by means of a flexible elastically compensated shell-type coupling is used to drive the fan of the centralized system for air cooling the electrical machinery and units.

The KT-7 compressor and the PSGUKhL2 starter-generator are turned by the diesel engine crankshaft through a distributive reduction gear. The latter is connected with the diesel's crankshaft by two identical elastic bar-type [sic] couplings connected together by a shaft.

The starter-generator is driven from the reduction gear by means of a similar bar-type coupling, and the compressor, by a standard plate-type coupling. Lubrication for the reduction gear for the centralized air cooling system [TsVS] and the distributive reduction gear is provided from the lubricating system for the diesel.

/Electrodynamic brake/ For the purpose of increasing the speed of trains and reducing the wear on brake shoes, a 2,700 kW electrodynamic brake (EDT) is installed in each section of the locomotive to maintain the constancy of the ordered speed on grades. Depending on local conditions, the limiting (ordered) magnitude of the electric braking force is set by the regulator of braking force on the control console.

The electric brake can be activated from all of the positions provided for the operating engineer in any running condition (running free or pulling). The system is automatically released in the pulling condition and automatically energized for the braking condition.

In stopping the train, the electric brake operates according to threshold charateristics. With a reduction of speed down to 20-30 km/hr, the EDT is automatically switched off, and the pneumatic brakes are switched on. The principal equipment of the EDT (the motor driven fans for cooling the resistors and the resistors themselves) are mounted in the roof of the locomotive above the high-voltage chamber. The set of electronic devices for automating the electrodynamic brake are installed in the body.

/Some results of trials/ At present a test specimen of the 4ET130 diesel electric locomotive is undergoing plant tune-up trials and special trials. The serviceability and technical characteristics of the new subassemblies of the locomotive are being verified. At the same time operational tests are being made on a test lot of four 2TE116A locomotives which are the prototypes of the 4TE130 locomotive and also on a 2TE121 locomotive which has the identical above-carriage structure.

The test locomotives are doing operational transportation work. The design of the locomotive as a whole, its assembled units and parts provide accessibility for inspection, sufficient ease of removal and interchangeability, suitability for repair, and safety of work during servicing and running repairs.

In the course of the tests, the expected economic efficiency of the locomotive also was achieved. It is due to the use of the centralized air cooling system and the smooth regulation of the operation of the motor driven fans of the cooling system.

The locomotive crew and the repair personnel note the convenience of the servicing and repair of the test machines and the comfortable conditions for work in the engineer's cabin.

Technical Characteristics of One Section

Size according to GOST 9238-73	1-T
Axle arrangement	$3_0\ 3_0$
Type of drive	Electrical, alternating and direct current.
Type of traction drive	Separate with main axle suspension of traction motors.
Service weight with a 2/3 supply of fuel and sand - in tons	138 ± 4.14
Loading on the rails by a pair of wheels at service weight - tons	23 ± 0.7
Designed speed - km/hr	100 (the possibility is provided by changing the ratio of the traction reduction gear, of obtaining a speed of 120 km/hr)
Designed continuous traction force at the rim of a wheel at 24 km/hr - tons	26
Power of the electric motors of the ventilating fans for cooling the resistors of the electrodynamic brake - kW	2 X 25
Brake compressor	KT-7, driven mechanically by the diesel engine shaft.
Compressor output at 850 rpm - m^3/min	5.3
Power of traction generator - kW	2250
Power of the auxiliary generator (supplying the electric fans of the diesel cooler and the electric boiler for three articulated sections whose diesel engines are not operating) - kW	630
Power of electric boiler for heating water for the diesel - kW	90
Rated power of the AMV-75 electric motors for the UK-2M, 1600 mm - diameter ventilating fans of the diesel cooler - kW	2 X 75

Power of the axial 900 mm diameter ventilating fan for the central system for air cooling the electrical machines - kW	58 (driven mechanically off the shaft of the traction generator unit through a conical reduction gear)
Power of cabin electric air-heater - kW	12
Diameter of wheels along rolling circle - mm	1050
Length of locomotive between axes of automatic couplings - m	21
King-pin base length of locomotive - m	11.57
Wheel-base length of carriages - m	3.7
Minimum radius of negotiable curve - m	125

Equipment supplies - kg:

Fuel	7000
Sand	1500
Water in diesel system	1200
Lubricating oil in diesel system	1200

4TE130 Diesel Locomotive

9136
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MARITIME AND RIVER FLEETS

HISTORY, PROBLEMS OF MOSCOW SHIPBUILDING YARDS

Moscow RECHNOY TRANSPORT in Russian No 3, Mar 84 p 30

[Article by Yu. Kamenskiy, chief engineer of the Moscow SSRZ [shipyard], and A. Okol'nikov, laboratory engineer of NOT [scientific organization of labor]: "The Business and Concerns of Shipbuilders"]

[Text] The Moscow Shipbuilding and Ship Repair Plant has been involved in shipbuilding since 1948. Many ships, mainly passenger ones, have been built during the past period of time. The motor ships "Moskvich" and then "Zarya" and "Moskva" were widely used and recognized. Every fifth passenger who enjoys the services of the river fleet in the Russian Federation falls to their share. More than 10 percent of the ships produced are being delivered to Czechoslovakia, Poland, Hungary, the FRG and other countries, including India and distant Australia.

Stability is characteristic for a shipbuilding program. The average length of a ship production cycle for 1 plan is 13 years and it's 4 years for 1 modification. So the "Zarya" motor ships with 3 modifications have now been produced for 18 years and the "Moskva" motor ships with 4 modifications for 16 years.

Such stability is indicative of the sufficiently high level of plans of which the TsTKB [central technical design office] is invariably the author, and it is indicative as well of the proper quality of operations being performed.

The TsTKB designers and the plant workers are striving to use the latest achievements of scientific and technical progress in every new plan or its modification. Confirmation of this is the awarding of the state symbol of quality to the "Moskva" and the "Zarya" motor ships.

The constant attention and efforts of the collective are directed towards improving the organization of production and the utilization of progressive manufacturing methods. All ships have long since been built by means of the flow line position method. Right now there are five lines operating: two used for assembling and welding the "Moskva" motor ships, one for the "Zarya" high-speed ships, and two for constructing the "Moskovskiy" passenger ships, and the series production of which begins in 1984.

The collective forms of organization and wages are widely employed at the plant. They include 57 percent of the workers. Ninety-five of the complex and specialized brigades are organized. The complex system introduced in 1980 for quality control of production is operating. Bi-metal which is widely used in the construction of ships made it possible to abandon riveting, and gas planing of metal, semiautomatic welding of AMG [aluminum alloy used as sheathing for holds of ships] alloys and other progressive industrial processes were introduced. A unit is operating for degreasing metal. All this promotes an improvement in the economic indicators of shipbuilding and which is indicated by the data cited in the table.

Table 1. Economic Indicators of Shipbuilding

Indicators	"Zarya" Motor Ship		"Moskva" Motor Ship	
Plan number	946A	R83	R51	R51E
Year for beginning production	1969	1974	1971	1976
Construction cycle	1970-1975	1975-1981	1971-1975	1976-1981
Reduction in percent:				
Labor-intensiveness	14.3	10.6	23	18.5
Production cost	10.5	26	16.6	14
Wholesale price	11.4	20.7	9.9	8.2

The collective is making every effort to increase production efficiency and is constantly incorporating new industrial processes and equipment. A specific, comprehensive program is being developed for further mechanization of labor. In 1984 it was planned to put in operation a unit with the "Kristall" program control for the plasma cutting of metal, machine tools with numerical control and other high production equipment.

Construction of new motor ships of the "Moskovskiy" type class "O" (ice) designed for hauling 150 passengers at a speed of 20 kilometers per hour is being set up at the plant. Plan 81080 was developed specifically for the Moscow SSRZ by Leningrad designers (TsTKB). Its main dimensions are 35.4 x 6.7 x 2.2 meters with a draught of 1.5 meters. The output of the power plant is 220 kilowatts. Features of the ship are an increased hull strength and the suitability for operating in broken ice under the conditions of prolonged navigation. The operating period of ships of this kind is 200-210 instead of 180 days as among available passenger ships of this type. Several motor ships will be produced in 1984.

The plant collective is actively working on assimilating new production and improving the plan. In the process of building the prototype motor ship more than 40 proposals were received which were directed towards improving its design and increasing its technological qualities and towards standardizing components and subassemblies. The skill and proficiency level of the shipbuilders is constantly increasing. The guarantee of successfully assimilating the construction of new types of ships is found in this.

However, unresolved problems are making themselves felt more and more acutely in shipbuilding in the sector. Ship planning is seriously lagging behind. As a result the plants have practically no time for the normal preparation of production. The reasons for such lagging are difficult to explain, if one considers the fact that ships of one and the same plan have been built for a long time.

It's poor as well that shipbuilders don't know anything about "ships of the future," although a familiarity with them is extremely necessary for planning the development of an enterprise for the very long term.

Such an acute problem as the prototype ship's production being ahead of schedule with respect to the series remains unresolved as before. Now, and as earlier too, the plant is forced to begin construction of the series while not waiting for trials of the prototype ship and for technical specifications to be worked out in accordance with their results. Losses in the labor-intensiveness of operations and the quality of production under these conditions are inevitable, but nevertheless the situation isn't changing.

There are insufficient means for mechanizing production and nonstandard equipment. For example, the plant is extremely interested in organizing the centralized manufacture and deliveries of devices for bending shaped stock, trimmers of sections and block assemblies, units with pneumatic or electromagnetic gripping devices for transporting flat metal products, and other means for mechanizing production. While enumerating the deficiencies, one cannot help but note that plants involved in shipbuilding are being insufficiently supplied with materials and complete equipment. In our opinion, organizing the operational accounting and redistribution of unused reserves of materials and items to the scale of the branch must occur as one of the measures for improving material and technical supply. It's expedient to use an automated accounting system and computer equipment for this.

Finally, there is an acute necessity to create an experimental base at the plant which would make it possible to organize the manufacture and trial of experimental designs and models of mechanisms and products.

A more rapid solution of the enumerated problems is an essential condition for further increasing efficiency in shipbuilding, expanding the programs of ships being produced and raising their technical and operational level.

9889
CSO: 1829/263

HISTORY, ACTIVITIES OF SUDOIMPORT FOREIGN TRADE ASSOCIATION

Moscow FOREIGN TRADE in English No 4, Apr 84 pp 18-23

[Article by Oleg Kropotov, general director of V/O Sudoimport: "Sudoimport: 30 Years of Export-Import Activity"]

[Text]

The specialized foreign trade association Sudoimport, our country's sole organization exporting and importing ships, marine equipment, spare parts and arranging the repair of ships in other countries was set up thirty years ago in May 1954.

To be more precise it is the association that had existed under the same name as far back as in 1930-1933 but which was reorganized. Then these functions were performed by Gormetmashimport (1933-1934), Machinoimport (1934-1951) and Transmashimport (1951-1954). To understand the reasons for these structural changes it is necessary to say a few words about the history of the Soviet shipbuilding industry and about the import and export of ships at certain stages of the Soviet Union's development.

As a result of World War I and the subsequent Civil War the majority of the Russian merchant ships were either sunk, or taken abroad. The young Soviet state then had only 14 per cent of its prerevolutionary tonnage, mainly old ships, and in a number of cases absolutely unfit for use.

Lenin attached great importance to transport facilities including sea transport as a material means of communication with other countries. It is not without reason that one of the first Decrees of the Council of People's Commissars dated November 24 (December 7) 1917 was a ban on the sale and temporary transfer of merchant navy to foreign citizens or organizations and in 1918 Lenin signed a Decree on nationalization of the merchant fleet.

However, the repair of old ships could not keep pace with the demands for sea transport to ship cargoes to and from foreign countries whose numbers were growing as the Soviet state established diplomatic relations with more capitalist countries and developed its trade with them. That is why the question on replenishing the Soviet merchant fleet was especially important for many years. Then considerable means were allocated for purchasing ships from foreign countries.

The Soviet shipbuilding industry started building new ships only in the mid-1920s after restoration of the national economy which had severely suffered from the Civil War and foreign intervention. The *Azneft* and *Grozneft* oil tankers were the first to be completed (using hulls of light cruisers whose construction was not finished before the revolution). The 25th of January, 1925, when four very well designed timber-carrying vessels of the Tovarishch Krasin type (load-carrying capacity 3,230 tons each) were laid on the building berths in Leningrad is considered the foundation of the Soviet shipbuilding industry. In a comparatively short period a series of larger timber-carrying vessels, refrigerator ships, universal dry-cargo ships, tankers, cargo-passenger vessels, ice-breakers and fishing trawlers were built. All the ships with the exception of the very first timber-carrying vessels and ships for Arctic navigation were equipped with Soviet-made Russkiy Dizel engines. Electric welding became more widely used when building hulls.

Nevertheless, the requirement for transport and fishing vessels greatly exceeded the then shipbuilding industry's possibilities. In 1930 the specialized foreign trade association Sudoimport was set up for purchasing ships from other countries to more quickly replenish the Soviet transport and fishing fleets. By 1933 the role of import in fleet replenishment has decreased and import functions were handed over to other associations.

Before World War II the load-carrying capacity of the USSR sea fleet (not to take into account fishing vessels) reached 2.1 million tons and it transported 32 million tons of cargo a year.

During World War II over 380 ships (total tonnage about one million tons) or nearly one half of the fleet were sunk or fully destroyed. The country's largest shipbuilding yards were demolished by enemy action.

When restoring the country's economy the shipbuilding yards were intensively reconstructed and technically re-equipped although they could turn out their first ships only in the very late 1940s.

Over these years Soviet shipbuilders did much to help other countries constructing socialism establish modern shipbuilding enterprises. Multifaceted assistance was rendered to these countries ranging from the training of specialists up to placing mutually beneficial orders for constructing ships and floating facilities. During this period the foundations of socialist countries' future wide cooperation and specialization in the shipbuilding industry were laid. The formation of the Council for Mutual Assistance in 1949 promoted this work especially.

The development with the socialist countries of mutually beneficial cooperation in the shipbuilding industry and trade in ships grew so rapidly that already in 1954 the specialized association Sudoimport, this time having broader functions than in 1930-1933, had to be set up again.

At present more than 800 firms and organizations in 80 countries are Sudoimport's business partners. The socialist countries' share is nearly 70 per cent of the Association's trade volume.

The CMEA member-countries' wide economic cooperation is based on coordination of their national economic plans. Bilateral and multilateral agreements on specialization and cooperation in manufacturing ships and marine equipment take a special place in the ship trade. These documents are supplemented by agreements on multilateral and bilateral scientific and technical cooperation within the Shipbuilding sector under the CMEA Standing Commission on Engineering Industry. There are agreements on scientific and technical cooperation with Yugoslavia and some firms in capitalist countries including Finland and Norway.

In the course of the joint work each CMEA member-country determined its form of specialization in constructing ships, floating facilities and marine equipment of certain types and sizes. Because of this the countries included in this organization can widely exchange various shipbuilding and ship engineering products under long-term planning agreements and each separate country can

perfect its production, reduce the products' manufacturing cost due to the large-series production not only for itself but also for its CMEA partners as well as for exporting competitive goods to the industrial capitalist and developing countries and fully eliminate the effects of the capitalist shipbuilding crisis, particularly sharp over recent years.

Thus, shipbuilders in the People's Republic of Bulgaria specialize in building mixed sailing tankers of dead weight two to three and five thousand tons, bulkers, dead weight 25,000 tons, container carriers (dead weight 12,000 tons), floating fuelers and ferroconcrete repair docks. The USSR also receives such ships and floating facilities. With the Soviet Union's assistance the manufacture of sea and river radar installations was mastered; a mutual exchange of technical documentation carried out, which considerably reduces the time for designing and building new types of ships, floating facilities and marine equipment.

At shipyards in the German Democratic Republic diverse classes of ships are built, universal dry-cargo, sea and river refrigerator vessels, container carriers, comfortable passenger ships, trawlers-seiners, trawlers-fish canneries of the Atlantic-supertrawler type, suction-tube multibucket dredgers, etc. (many of which are for the USSR). Recently the construction of Ro-Flow and Ro-Ro types for mixed river-sea transportation was undertaken to fill USSR's orders.

The Polish People's Republic is one of the largest ship suppliers to the USSR and other CMEA member-countries (as well as to the industrial capitalist countries). Polish shipbuilders have specialized in building large-tonnage ore-oil carriers (dead weight over 100,000 tons), large bulkers, large horizontal loading vessels (Ro-Ro), fish canneries, banana-carrying refrigerators and transport refrigerator ships, trawlers-fish canneries, supertrawlers, timbercarrying vessels, etc. Polish shipyards also repair Soviet ships.

First started in the 1970s, the manufacture of sails and motor pleasure boats and sports vessels is progressing.

Shipbuilders in the Socialist Republic of Romania specialize in constructing small dry-cargo ships and tankers for internal and mixed navigation, tankers for the Caspian Sea as well as soil-carrying hopper-barges.

The Czechoslovak Socialist Republic to fulfil orders placed by the USSR and other CMEA member-countries constructs suction-tube multi-bucket dredgers (including those for extracting gravel); suction dredgers (productivity 2,500 cu.m/h) and floating pumping plants for the irrigation of cotton fields in the Central Asian regions are being built. At the same time comfortable river passenger ships, dry-cargo vessels of the mixed river-sea class are being constructed. In the near future the list of suction dredgers will have new up-to-date facilities added to it.

The Hungarian People's Republic having started with building a series of small dry-cargo ships of the Tissa type for the USSR now specializes in making sea and river floating cranes, tug-raft chutes and pusher-tugs for operation on the Danube and Siberian rivers.

The Yugoslavian shipyards construct tankers, passenger vessels, large floating docks (lifting capacity up to 60,000 tons), port and sea-going tugs, ships servicing drilling platforms, railway ferry-boats, suction tube dredgers, etc. for the USSR.

The Soviet Union supplied the CMEA member-countries and Yugoslavia with ore-carrying ships of the Baltika type (dead weight about 36,000 tons), tankers (dead weight 1,500 and 16,300 tons), ships of the Dnepr type for transporting general cargoes and containers (dead weight 15,000 tons), coal-ore carrying ships of the Zoya Kosmodemyanskaya type (dead weight nearly 50,000 tons), floating docks (lifting capacity 4,500 and 12,000 tons), floating cranes (lifting capacity 150 to 300 tons), a great number of hydrofoil craft, suction tube dredgers of various capacities and other ships of the transport, technical and auxiliary fleet.

Sudoimport maintains long-established contacts with Finnish shipyards which supply the USSR with sea and river ice-breakers of various capacities (up to 36,000 h.p.), dry-cargo ships and tankers for navigation in the Arctic, ships of the Ro-Ro type and lighters, auto-passenger and research ships, tug-rescue vessels, ships of the river-sea class with various load carrying capacities including those designed for navigating the Saimaa Canal, floating hostels, etc. The Finnish firms Wärtsilä, Valmet,

the port side, reduced his travel and began to divert the floating stock to the line of white buoys. In this case, he too didn't call the navigator of the "Krasnodon" motor ship on radio communications, didn't find out what caused the change in the divergence procedure and didn't report the location of the floating stock near the left border of ship travel and the impossibility of diverging [from the procedure] of meeting with their starboard sides. Ti floating stock continued to deviate to the right according to travel and then the OTA-898 motor ship was given the course "full speed astern."

Measures for averting a collision were taken on the "Krasnodon" motor ship (turning to starboard and operating with the engines in reverse) in immediate proximity from the floating stock being pushed, and they didn't provide a positive result. The "Krasnodon" motor ship struck its stem against the bow of the floating stock (position 3). As a result both of them received damage.

As the accident investigation showed, the planned shipping line measures for averting the risk of accidents are not always being carried out. In particular, for the 1983 navigational period it was stipulated in them that the tutoring captain or pilot is directed to render assistance on the first trip when a captain is assigned from the navigators or when a captain is transferred to a more powerful type of ship. Assistance of this kind wasn't rendered to the captain of the "Krasnodon" motor ship.

Unfortunately, this isn't the only instance in the shipping line of not carrying out measures for averting the risk of accidents. For example, in July 1983 the shipping and fleet traffic service didn't provide for constantly locating an auxiliary ship in a difficult section of the Yenisey--the Verkhneshiverskiy shoals to the Atamanovskiy rocks--and for rendering assistance in accordance with the upsurge of floating stock being towed and pushed. This became one of the causes for another transportation incident.

The running in to shoals and grounding of ships and floating stock are typical accident-type incidents in a section of the Yenisey from Podkamennaya Tunguska to Turukhansk. As a rule, this occurs near the right bank. More frequently of all, accident-type incidents are observed when ships pass by this section against the current under conditions of decreased visibility, although the given navigational area isn't complicated for shipping with the exception of a few shoals. The breadth of the course for ships here is sufficient and its axis is basically situated at a considerable distance from the banks, so therefore the borders of the navigable zone aren't enclosed with floating navigational signs, except individual spots where this is set in accordance with instructions on maintaining navigational signs on inland waterways. A navigational fix on ships is possible from section line to section line, the visibility range of which is 7 to 10 kilometers and 12 to 15 kilometers and more at individual section lines. The left bank in this section of the river is basically low and gently sloping, but the right one which is high and hilly is a good natural reference point. This also predetermines the approach of ships to the right bank.

When there is good visibility, it's easy for navigators to get their bearings in this section. If there is no radar equipment on the ships or for reasons of some kind radar surveillance isn't organized, complications occur when there is

a deterioration of visibility. Due to the considerable breadth of the river (1.5 to 2.5 kilometers) it's difficult to get one's bearings under conditions such as this, or too it's impossible since the alignment signs or the lights on them disappear from view because of the great remoteness. In these instances ships proceeding downstream come to anchor. The navigators of motor ships moving upstream prove to be less disciplined. When there is a deterioration of visibility, they don't always cease movement in a timely manner, they continue to travel without radar surveillance while getting their bearings by the right bank and they approach it at a dangerous distance. As a result, this frequently leads to the running in to shoals and grounding of ships and floating stock. Violation by navigators of section 12 paragraph "k" of the navigational regulations for inland ship routes of the RSFSR is the cause of the accident-type incidents which were mentioned.

Navigators must remember that their actions under any navigational conditions must be directed first and foremost towards carrying out the regulations which govern traffic safety.

9889
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SPECIALIZED PORT FACILITIES FOR HANDLING OVERSIZE CARGO URGED

Moscow MORSKOY FLOT in Russian No 3, Mar 84 pp 18-19

[Article by A. Yakovtsev, senior stevedore, Port of Ilichevsk: "Specialization, Subsequent Development"]

[Text] The development of basic engineering, oil production, mining and electrical power industries in our country has shown that the marine fleet will be constantly burdened by the transportation of assembled units of equipment which fall in the category of overweight and oversize cargo. Consequently, it makes good sense to give some thought to improving the processing of vessels carrying this cargo.

The first step in the organization of this work has already been taken. In each of the shipping regions primary ports have been specified for the processing of this overweight and oversize cargo. These ports are Leningrad, Ilichevsk and Vladivostok. However, it is necessary to take the next step: to establish special complexes in them.

I shall introduce an example from foreign practice. In 1983 grain reloaders destined for Odessa whose main components were two towers whose body frames weighed 352 tons each, were loaded on the motor ship Stakhanovets Kotov in the port of Bremerhaven. Both local dockers and Soviet seamen took part in the operation to secure the cargo. The job was divided equally. The securing of the towers was finished practically simultaneously and only one day had to be spent on the operation. According to specialists, in a Soviet port not less than 3 days would have to be spent on such a job.

Even the most superficial analysis of time budgeting for vessels utilized for the transporting of overweight cargo shows that standing time is excessive. Many examples confirm this fact.

Here is an example from the operations in the port of Ilichevsk. On 13 February 1983 the motorship Ostrogozhsk of the Far East Shipping Company bound for Vladivostok was brought in to be loaded with a bilge water container, 186 tons; an oil waste container, 43 tons; a roadstead launch, 83 tons; a motor vehicle KrAZ (from the Kremenchug Auto Factory), 13 tons. Loading work began only on 20 February. A large portion of this time (85 hours) was spent on answering the question of what kind of slings to use in loading the bilge water container and where to get them.

In May 1983, during the loading of 50-ton constructions onto the motorship Matsesta, a substantial loading delay was caused by the lack of enough fastening mateials and materials for cargo separation: turnbuckles, clamps, cables and beams.

In June 1983 the motorship Parfentiy Grechanyy stood for 100 hours waiting for cable to secure a 42-ton hydrofoil Meteor loaded on its deck.

The question of offloading overweight equipment from barges of the Soviet Danube Shipping Company is even more critical. Here, standing time is calculated in weeks. And clearly any idle time, even the most insignificant, carries with it losses not only in operational expenses but in irretrievable losses in transporting capability and in freight which as a rule adds up to extremely large sums of money.

Practice has shown that almost 50 percent of vessel idle time in overweight cargo transportation is caused by shortcomings in the organization of Cargo Transfer in Ports.

It seems that the creation of units for processing overweight equipment would substantially reduce the idle time of the fleet and also the occasions when cargo and even vessels are damaged. For example, a 43-ton turbine fell while being offloaded on the motorship Fizik Vavilov. Repairs had to be made to the unit and to the vessel.

Equipment is one of the traditional types of cargo handled in Ilichevsk. Its characteristics vary within broad limits. In each of the port areas there are brigades that process the vessels and equipment.

At the outset, in order to acquire experience in working with overweight cargo it would be sufficient to create a group on the basis of a brigade that in the main would specialize in the processing of vessels with this type of cargo. On the wharf reserved for them and equipped with appropriate portal cranes, the specialized brigade group should have its own supply of fastening materials, rigging equipment, planks and beams.

It seems expedient to assign a senior technician of the corresponding area as chief of such a specialized unit as well as to assign to the unit an engineer-technician (ITR), and a specific complement of stevedores and welders on shift.

Practice has shown that because of the diversity of overweight and oversize cargo, it is difficult to adopt standardized cargo transport technology. This is possible only in cases of uniform cargo shipment.

In most cases it is important to develop in advance individualized technical plans for the loading and unloading of oversize cargo units, to support these operations with suitable rigging, fastening and packing materials. Clearly, specialized brigades of dockers and technicians would conduct such operations more successfully. The absence of such specialization leads to unjustified idle time for vessels.

8750
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PORT AND TRANSSHIPMENT CENTERS

ROLE OF FINNISH PORT OF KOTKA IN SOVIET SHIPPING

Moscow MORSKOY FLOT in Russian No 3, Mar 84 pp 52-53

[Article by A. Kyuyunyaryaynen, chief editor of the Finnish journal 'NAVIGATOR': "The Commercial Port of Kotka"]

[Text] The port Kotka on the southern coast of Finland is known to many Soviet seamen. It is the largest Finnish exporting port and serves as an important staging area for the transit shipment of USSR foreign trade cargo.

The end of February is a quiet time here. Rough ice has locked up the shore-line waters. Above the channel which is open for incoming vessels it is foggy; the sides of the vessels are overlaid with a thick crust of ice. In the moderately cold weather three vessels are being unloaded at berths (it seems certain that two of them are Soviet). There is almost no movement on port territory. Only once in a while a vehicle traverses the route to a warehouse and back.

In summer everything is different. Then more than 30 berths of the port are occupied; there is enough work for 29 cranes. Covered warehouse facilities with an area of more than 160,000 square meters are being filled with a variety of cargo.

What Is the Origin of the Port?

It has existed since 1872. At that time maritime exports of lumber were 7,700 boards a year. In 1982 port cargo turnover was 4.4 million tons; in 1980, a better year, it reached 5 million tons.

The lumber industry was the reason for the appearance and development of the port on this spot. The city of Kotka is located in the wide delta of the Kymmene River along which large forest tracks stretch. In time, thanks to the growth of private industrial enterprises, the city became a port city. The lumber factories and the port developed a viable symbiosis. Now, 60,000 people live in the city.

Director I. Elo, who is subordinate to municipal authorities, manages the port at the present time. He acquainted us with the multifaceted activity of the port of Kotka and told us about new plans and prospects, one of the most important of which is the construction of a deep water harbor.

Exports Are the Main Thing

Kotka is Finland's second largest port. Its main job is to process lumber cargo for export. However, it also plays a major role in processing import cargo: fuel and industrial raw materials. The port is also prepared to receive general and container cargo although substantially less of this cargo passes through it.

The port territory is divided into many sections. The main port is located in the old part, where in the past the first wharves were outfitted. Beside the main port there are the Polish wharf, the fishing harbor, Sunila, the fuel and industrial harbors and Khietanen.

During recent years the harbors have been substantially expanded. A new wharf area was established in the main port. Much construction work has been done in Kheitanen, which in area is the largest part of the port. Here the line of wharves was lengthened by 260 meters. A new warehouse facility of arch construction was built for the storage of dangerous cargo. In addition, a complex for the reception and cleaning of ballast water was constructed in the fuel harbor.

The Design of the New Harbor

It had become clear by the end of the 1970's that the productivity of the berth processing bulk cargo (the so-called Polish Berth) was insufficient. The quantity of cargo passing through had doubled during the preceding few years. Also, the water depth at the berth and its approaches was only 8.5 meters.

These difficulties brought to life a project for a new deepwater harbor on the island of Mussalo. Research conducted there in 1979 produced the designation of three locations for the construction of berths with approach channel depths of not less than 15.3 meters. The final choice was made with consideration having been given to the technical feasibility of the project, to environmental concerns and also to locating the wharves as close as possible to a coal fired electricity generating facility.

Transit Traffic

The processing of Soviet transit cargo has been done in Kotka since 1976. Since then, the stream of cargo has grown persistently, reaching 1 million tons in 1980.

Of the bulk cargo, ore concentrates predominate, the import of which reached 300,000 tons in 1980. More could have been processed if the depth and productivity of the port equipment had permitted.

In the same year the USSR exported through Kotka 150,000 tons of potassium salt. The export of this cargo also would have grown if there had been more loading capacity.

Finnish enterprises that deal with Soviet transit shipments advocate a greater volume of urea export and of grain import. Nevertheless, because of the lack

of capacity, the port was not able to conduct negotiations for the increase of transit cargo in this area.

To increase transit shipments, the port administration places its hopes on the construction of the deep water Mussalo harbor. It may possibly be built at the end of the 1980's. I. Elo stresses that although Kotka at present has not exhausted the possibilities of expanding these shipments, with the construction of the new port the stream of transit cargo will substantially grow.

Successes and Difficulties

The modernization of the port will lead to a rise in the number of vessels visiting the port and to an increase in their size. Even now, larger and larger vessels visit Kotka, but in smaller numbers. The depression in world shipping has been reflected in port operations.

For example, in 1982, 1,523 vessels made stops at the port, 140 fewer than in 1981. Accordingly, port cargo turnover went down for the year by 10 percent.

The 15.3 meters deep pier that is being constructed in the port will make it possible for bulkers with deadweight of up to 120,000 tons fully loaded with coal to call. However, during the first years of operation Panamaks type vessels with a deadweight of about 60,000 tons will be used.

About one-third of the vessels visiting the port are Finnish. Second in number of visits are the ships of the Federal Republic of Germany. In third place are Soviet ships. At present, Kotka is purely a commercial port. The last passenger vessel to call was the Soviet motorship Sayma several years ago in the summer when it was sailing the route Kotka-Leningrad-Lappeenranta. The Sayma has since been retired and now serves as a training vessel for the Moscow Club of Young Seamen. In winter vessel access to the port is maintained by government icebreakers, while in port territory tug-ice cutters help. In Kotka there is the best tug-ice cutter in the country, the Vinkari, which was launched at the Rauma-Repola Shipyards in Savonlinna.

The Seamen's Club

Upwards of 10,000 seamen a year stop in Kotka. Services for them are concentrated in the Seamen's Center, which has a 20-bed hotel, a sauna, rooms for rest and relaxation, and a club.

The size of the hotel is completely satisfactory except on unusual occasions. Just such an exceptional occasion was when the medium-sized German tanker Khai ran aground on a sandbar near Kotka. Happily, the demand for emergency night lodging arises very rarely. Finnish seamen are the main patrons of the hotel.

Seamen of all countries use the other services of the Center. In 1982, for example, representatives of 27 different nationalities were guests here. Among them were many Soviet seamen; it's a fact that the Kotka ship repair yards are continuously servicing ships of Soviet registry.

The sauna is especially popular; up to 100 men can take the steam at one time. In the center there are also a swimming pool, a gymnasium and billiard and reading rooms--in the latter, besides papers and magazines in the Scandinavian languages there is material in Russian--and a good cafe.

Soviet seamen take free excursions around the city and its environs. Quite often, soccer matches are organized between teams of various vessels. The local all-star team participates in these matches.

Valmet Repairs and Builds

The repair of vessels is the main task of the yards. In 1982 repair work on Soviet vessels alone was done in the amount of 2 million rubles. According to the yards director P. Salmensaari, tanker repair was especially labor consuming.

The yards can handle in dry dock a vessel with deadweight of 5,000 tons. The larger vessels that have docked here have had a length of 135 meters and a beam of 18 meters. Valmet works together with a group of yards; if a certain job cannot be done in Kotka, another yard will do it.

The yard administration welcomes Soviet orders which help provide the yard with year-long work.

Valmet not only repairs vessels in Kotka. Here, in particular, funnel sections for series SA-15 vessels intended for arctic operations are manufactured. With special pride P. Salmensaari told about four trawlers built at the yard. The director hopes that the cooperation of the yards with the Soviet Union in the area of vessel repair will develop.

The Expansion of Wärtsilä

Wärtsilä has traditionally had a specialization different from that of Valmet. In recent years the yards have substantially improved production, having done refitting in the overall amount of 11 million Finnish marks. Now there is a well-equipped pier. The yard director in Kotka L. Gudenkhelm states that after modernization the productivity of the yards grew by 10 percent. Repairs are now done in shorter periods of time.

In the vessel repair unit of Wärtsilä work is distributed so that large vessels are repaired in Turku and vessels shorter than 130 meters in Kotka. About half of the vessels repaired here have been Soviet vessels.

In addition, air-cushion vessels are built for the USSR in Kotka. These are primarily of the type that are towed. However, as a result of an agreement with the buyer, self-propelled vessels have now begun to be produced. They are equipped both fore and aft with unique "propeller-type rotors." As a result, the vessel is able to move independently across water, muddy ground, and across water, muddy ground, and across the surface of ice.

The vessel repair yards are only a part of the developed industry concentrated around the port. The port, as formerly, remains the "maritime soul" of the city of Kotka, the future of which in a decisive way depends on the development of shipping.

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